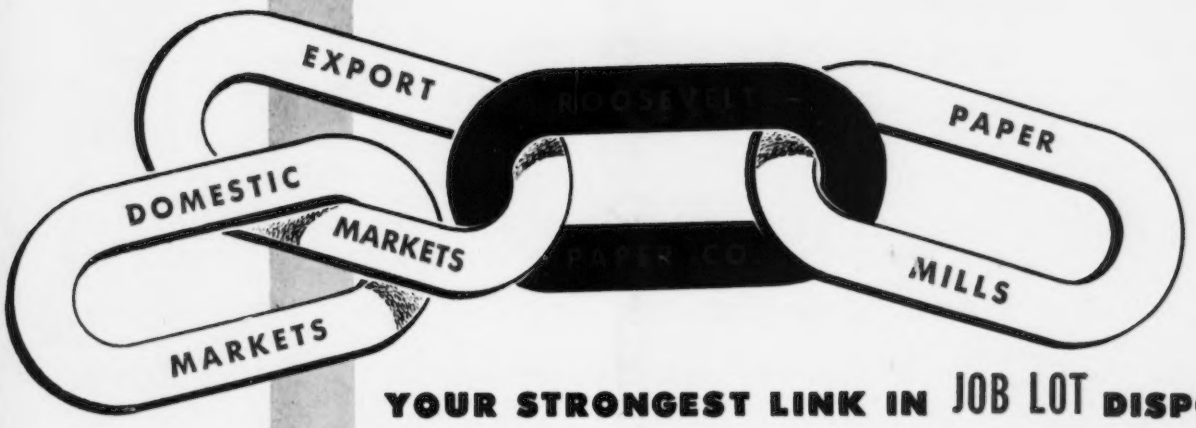
What is the Paper and Board Outlook up to 1979? See the Stanford Research Report • Is Your Plant Getting the Most from its Batteries? Check and See

PAPER TRADE JOURNAL

OCTOBER 8, 1954



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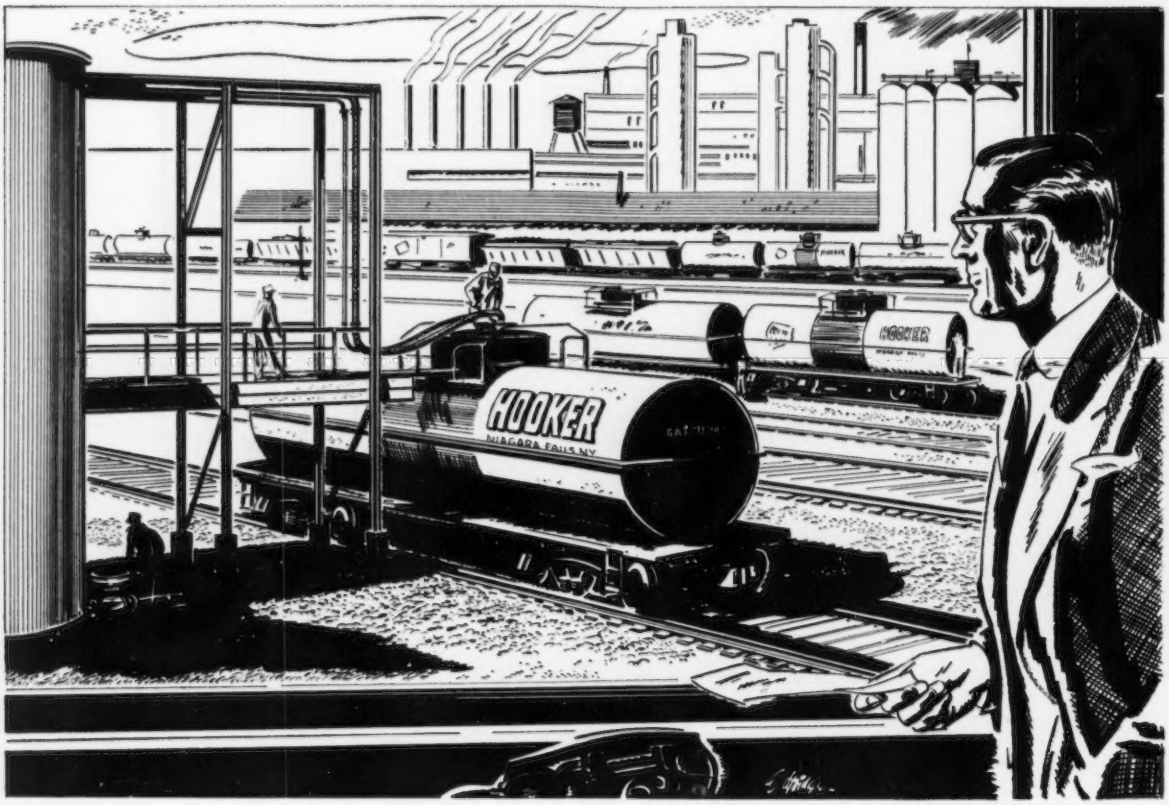

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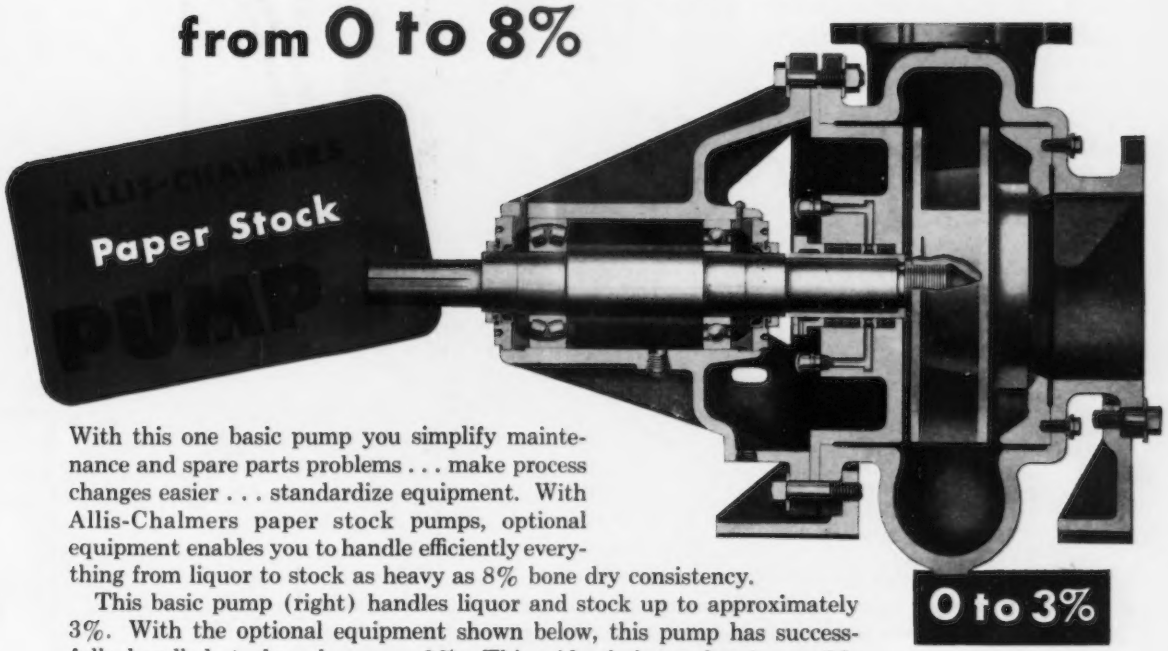
One Pump

handles stock consistencies from 0 to 8%



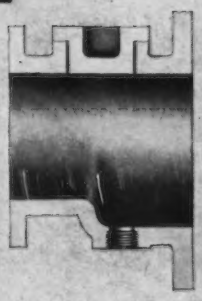
With this one basic pump you simplify maintenance and spare parts problems . . . make process changes easier . . . standardize equipment. With Allis-Chalmers paper stock pumps, optional equipment enables you to handle efficiently everything from liquor to stock as heavy as 8% bone dry consistency.

This basic pump (right) handles liquor and stock up to approximately 3%. With the optional equipment shown below, this pump has successfully handled stock as heavy as 8%. This wide choice makes it possible for your Allis-Chalmers pump representative to recommend exactly the right combination to give you greatest production at lowest cost.

Optional Equipment That Fits Your Requirements

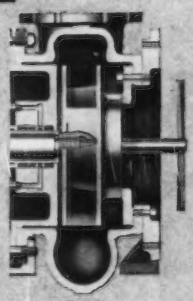
3 to 5%

Suction Nozzle Piece with special offset increaser is designed to prevent stock dewatering, cut suction pipe friction. Features removable handhole cover for cleaning.



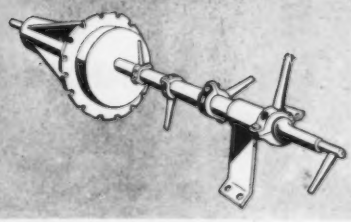
5 to 6%

Feeder Vane Assembly with 16-inch suction adapter (on all sizes up to 10-inch discharge) eases flow at suction. Vane rotates with impeller, breaks up lumps, aids stock movement into impeller eye.



6 to 8%

***Hi-Density* Feeder** is separate unit in stock chest. Rotating vanes force stock into pump, break up lumps, improve flowability of heavy stocks.



Hi-Density is an Allis-Chalmers trademark.

Remember, Allis-Chalmers can supply the complete pumping unit — pump, motor, control and drive — assembled and ready to run. Next time you have a stock pumping problem, call your Allis-Chalmers representative, or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletins 52B7112 and 08B6725.

A-4320

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Published every Friday by Lockwood Trade Journal Co., Inc., 15 West Forty-Seventh Street, New York 36. Phone: Plaza 7-2370.

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Entered as Second Class Matter at the post office at East Stroudsburg, Pa., under Act of Congress of March 3, 1879. Publication Office at Lockwood Trade Journal Co., Inc., 34 North Crystal St., East Stroudsburg, Pa. Printed in U.S.A. Copyright 1954 by Lockwood Trade Journal Co., Inc. *Paper* established Feb. 17, 1899, combined with *Paper Trade Journal* Nov. 16, 1899. *Paper* established Sept. 21, 1910, combined with *Paper Trade Journal* February 19, 1926. All rights to the above titles reserved. Contents of *Paper Trade Journal*, including all articles, illustrations, etc., are copyrighted and may not be reprinted except by permission. *Paper Trade Journal* is indexed in Industrial Arts Index and Engineering Index. Also publishers of Lockwood's Annual *Directory of the Paper and Allied Trades.*

REMEMBER THESE DATES

OCT. 18-21: TAPPI Engineering Conference, Benjamin Franklin Hotel, Philadelphia, Pa.

OCT. 18-22: 42nd National Safety Congress and Exposition, Conrad Hilton, Congress, Morrison and La Salle Hotels, Chicago, Ill.

NOV. 9-10: National Paperboard Assn. Annual Meeting, Waldorf-Astoria Hotel, New York, N. Y.

NOV. 17-19: TAPPI Corrugated Containers Conference, General Oglethorpe Hotel, Savannah, Ga.

FEB. 20-25: APPA Annual Meeting, Waldorf-Astoria Hotel, New York, N. Y.

FEB. 21-24: TAPPI Annual Meeting, Commodore Hotel, New York, N. Y.

MAY 18-21: Third Western International Meeting of the Pulp and Paper Industry, Empress Hotel, Victoria, B. C.

PAPER TRADE JOURNAL

Published Weekly Since 1872

OCTOBER 8, 1954. *Vol. 138, No. 41*

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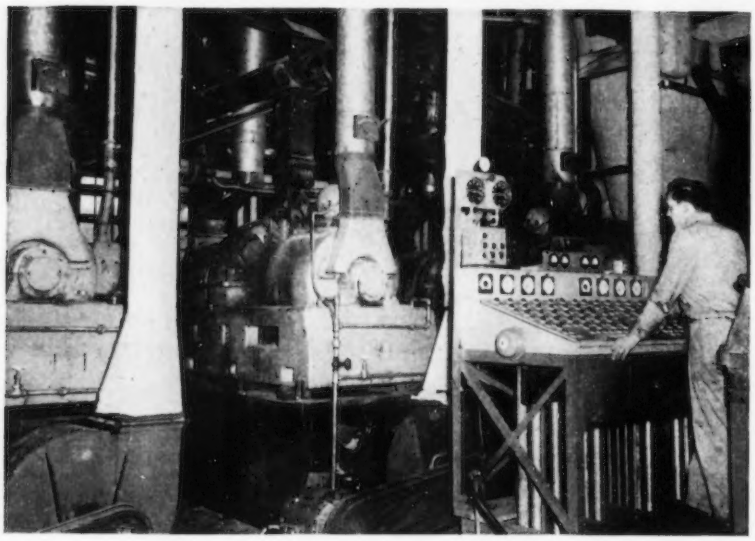
LOCKWOOD TRADE JOURNAL CO., INC., 15 W. Forty-Seventh St., N.Y. 36

Phone: Plaza 7-2370

GEORGE E. LOCKWOOD, President and Treasurer — ARTHUR E. GORDON, Vice-President — FREDERICK E. WINKLER, Secretary

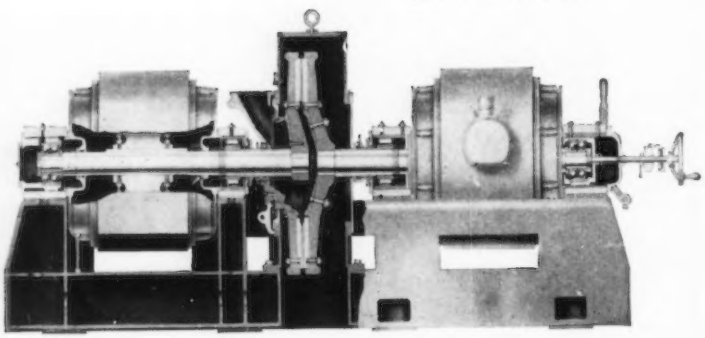
Semi-dry chips fiberized in 6 Bauer Refiners at Coos Bay Lumber Co.



Bauer

Shown in the photograph are three of the six Bauer No. 400 Refiners in the hardboard plant of Coos Bay Lumber Co., Coos Bay, Ore.

Chips from log centers and veneer trimmings are steamed for 5 to 20 minutes. From the cookers the semi-dry chips are distributed to the Bauer Refiners, each of which has two separately powered discs rotating in opposite directions.



Sectional view of Bauer No. 400 Refiner

By the action of the plates, the material is rolled, rubbed and squeezed until the fibers are separated. This tends to make the fibers more slender without being shortened, for the Bauer Refiner essentially is not a cutting machine.

Of course, everyone in the pulp and paper industry recognizes the difference between the fiberizing of semi-dry chips and the refining of pulp slurry at 4% to 5% fluid consistency. Yet Bauer Refiners are used with equal success for both processes, proving their adaptability and versatility. This explains why these Bauer machines are the most widely used disc refiners.

Further information on our refiners, both single and double revolving disc types, will be gladly furnished. You are invited to ask for our literature. Remember, too, that our research laboratory is available for testing the fiberizing, refining, reduction, or mullen development of any material in which you are interested.

THE BAUER BROS. CO.

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PAPER TRADE JOURNAL

TRENDS

Substantial Improvement Noted In Industrial Production

Industrial production took a moderate turn for the better during the week ended September 29, according to a late report from Dun & Bradstreet. Compared with the year-ago week, total output shows a substantial improvement over earlier 1954 records. Output was about 7 percent lower than in 1953.

Steel production at 69 percent of capacity was the highest in 14 weeks, though automobile producers have not ordered the quantities of steel expected during a period of model changes. Construction and defense uses have recently been high. Lumber production was 28 percent higher than in the week ended September 22. Carloadings were 0.2 percent less than in the previous week and 13.4 percent lower than in the 1953 week.

Paper Output Up. Paper mill operations were at 96.4 percent of rated capacity for the week ended September 25, compared with 92.1 (revised) in the previous week and with 98.2 in the corresponding 1953 week.

Paperboard production at 92 percent compared with 93 in the previous week and with 98 percent a year ago.

Personal Consumption and Construction Strongest Elements

Strongest elements in the aggregate demand pattern are named by the Office of Business Economics as personal consumption and new construction, especially residential building. Defense production and fixed business investment pursue their gradual decline.

Consumer Buying Holds Steady. Noted by the OBE in its September *Survey of Current Business* was that buying by consumers is holding to the steady pace of recent months, supported by the sustained and unchanged flow of personal income.

Private Construction Rise. New construction put in place in August aggregated $3.1 billion, seasonally adjusted, with private construction showing a rise for the seventh consecutive month, and residential building accounting for most of the advance. Industrial construction reportedly has tapered off with the completion of many expansion programs. Other private nonresidential construction continues unprecedentedly large and well ahead of comparable months in recent years. Public construction also is active with nonresidential and highway construction substantially in advance of comparable months of recent years.

Business Inventories Whittled

Also reported by OBE was that business whittled inventories further during July—from $79.0 billion at the end of June to $78.4 billion on July 31. About half the reduction was in manufacturing, with finished goods holdings of manufacturers showing the first substantial decline since manufacturing operations started to move lower a year ago.

In contrast, purchased materials stock which had been trending down, increased slightly during July.

For the month of August, inventories of manufacturers showed a further reduction of $300 million. About two-thirds of the decrease was in durables, one-third in durables.

Noted by the *Survey of Current Business* was until quite recently most of the inventory reduction had been in purchased materials; in recent months, the rate of liquidation of goods-in-process had been increasing.

Rise in Durables Orders. New orders placed with manufacturers during August were up about 1 percent over the July-seasonally-adjusted rate. The improvement occurred entirely in durables where orders rose about 3 percent and thus regained the Spring rate. Unfilled orders held by soft-goods fabricators expanded fractionally, the Department reported.

Waste Paper Prices Hold On Notably Strong Market

Early October prices show no appreciable change in waste papers at the contract level. Low grades as well as high pulp substitutes failed to develop any marked changes for early October deliveries. Spot buying is active and at higher prices than the volume tonnage on a very strong market.

Strike of Local 27 Ties Up In-and-out Trucking

Collections and deliveries of waste paper in the New York area are tied up by a strike of Local 27, Paper Products and Miscellaneous Chauffeurs, Warehousemen and Helpers (AFL).

The walkout which became effective on October 1 does not effect fine paper distributors Local 807 which has extended to October 15 the period of negotiations. Coarse paper wholesalers however are reported crippled by the union action.

Reported to be contrary to the request of the International Brotherhood of Teamsters for a 15-day extension of the period of negotiations, the strike is creating a fire hazard in all industrial plants and office buildings where waste paper accumulations are piling up.

To press time, no agreement had been reached, though it is reliably stated that pressure from the mayor's office was being exerted to end the walkout.

Brown's Pulp Accounts Assured of Supply Continuity

Fears that the sale of Brown Co.'s pulp and paper mills in Canada would rob U.S. consumers of special grades of kraft pulps have been laid to rest. Simultaneously with the announcement of the proposed sale to Canadian International Paper Co. (see page 9) Brown Co.'s pulp division notified its accounts that the Brown Co. will issue contracts for 1955 during the month of October which will be honored by the new owners.

Plans are being worked out, said a Brown Co. spokesman, whereby Brown Corp. customers will have a continuity of supply in 1955 and in the future.

The La Tuque mill provides 12 grades of prime bleached and unbleached krafts to U.S. consuming mills.

Increased Activity In Cotton Linters Markets

Moderately large demand is being reported for southwestern cotton linters markets with felting grades in specially good demand. Trading in chemical linters increased, and bleachers were reported to have purchased a large volume of medium-quality second cuts at prices slightly below the support level in western Texas.

In the far western area, the market was more active. Sales of several hundred bales of grades 2 and 3, and several thousand bales of grade 4 were reported by the U.S. Dept. of Agriculture.

For the southeastern area, the market was moderately active during the week ended September 30. Demand covered a wide range of qualities, and sales for prompt and nearby shipment were moderately large. Prices for the felting grades advanced from ¼ to ½ cent per pound.

Most oil mills were offering freely at prevailing market prices in the south central area, and some were said to have booked second cuts through November.

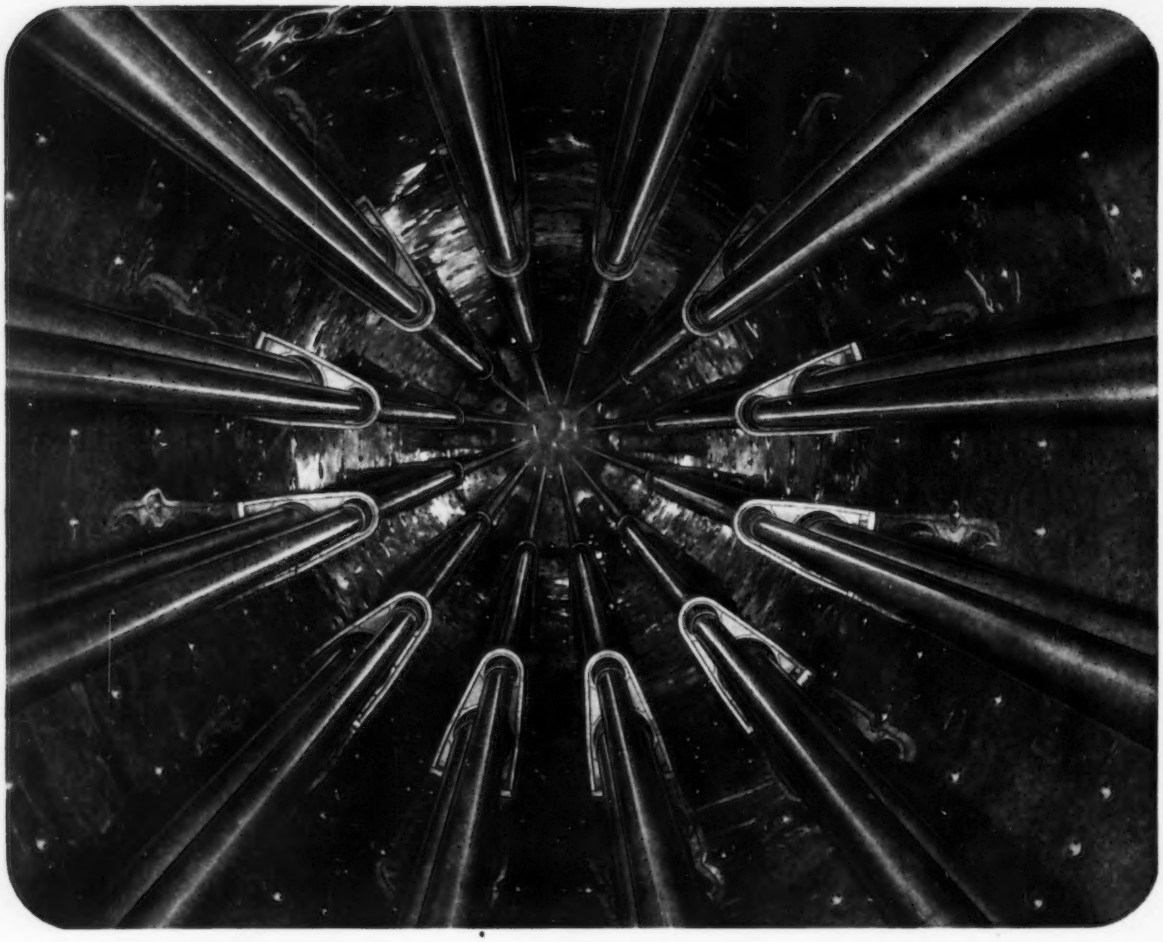
Linters Exports Double. Exports of 237,000 bales cotton linters from the U.S. in the 1953-54 season were more than twice as large as the preceding season's total of 107,000 bales.

Imports of 166,000 bales were less than half as large as the year ago total of 341,000 bales. —E.P.N.

Paperboard Production (Tons)*

	Sept. 25 1954	Sept. 18 1954	Sept. 26 1953
Production	246,383	244,607	257,907
New Orders ...	211,305	235,147	226,801
Unfilled Orders.	369,305	408,830	481,985
% of Activity..	92	93	98

*Source: National Paperboard Assn.



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FREE—Write for your copy of the new TRENTWELD price calculator. Just a tug at the selector slide gives you complete price information and weight per foot of the tubing size and grade you need. Better send for your free copy now.

TRENTWELD stainless steel tubing gives economical, trouble-free service over long periods of use. It's an ideal choice, for example, for applications such as the 60-foot rotary kiln dryer you are looking into in the photograph above . . . operating at high temperatures and where corrosive conditions are encountered.

In fact, you just can't buy better tubing than TRENTWELD for any application. That's because TRENTWELD stainless and high-alloy *welded* tubing is a product of tube mill specialists. Each tube has a uniformly sound weld indistinguishable from the parent metal and just as strong and corrosion-resistant.

Whether or not your job is as large and complex as a rotary dryer, you can specify TRENTWELD tubing with confidence. And when it comes to tubing sizes and finishes, Trent offers the widest range in the industry . . . from ⅛" to 40" O.D. and up. Next time you have a job involving tubing, remember—you can make it better with TRENTWELD.

TRENTWELD

STAINLESS STEEL TUBING

TRENT TUBE COMPANY, GENERAL SALES OFFICES, EAST TROY, WISCONSIN (Subsidiary of CRUCIBLE STEEL COMPANY OF AMERICA)

WEEK OF PAPER TRADE JOURNAL OCTOBER 8, 1954

Agree to Sell La Tuque Mill to Canadian International

Agreements for sale by Brown Corp. of its Quebec woodland holdings and bleached kraft pulp mill to Canadian International Paper Co. and of its hydro-electric power interests to Shawinigan Water and Power Co. were announced on October 1.

Laurence F. Whittemore, chairman and president of Brown, said that the agreement entered into by the companies is subject to approval of the shareholders of the parent Brown Co. of Berlin, N. H., at a meeting scheduled to be held November 19 in Portland, Maine. The total consideration will involve between $40 million and $45 million depending on final inventory and other adjustments to be made on the date of final closing, about December 1.

Extensive Woodlands

The properties to be sold to Canadian International include approximately 2,500,000 acres of woodlands, consisting of Crown lands under lease and freehold properties, and the pulp mill located at La Tuque, Que., which has a capacity of approximately 165,000 tons per year of high-grade bleached kraft pulp.

Shawinigan Water and Power Co. is buying Brown's half-interest in the capital stock of St. Maurice Power Corp., which in turn owns a big hydro-electric generating station at La Tuque.

Brown Corp. presently employs about 3,000 people at the La Tuque mill and in its woodland operations. Mr. Johnson said that Canadian International plans to continue all mill and woodland operations on the present basis and that the bleached kraft pulp production of the mill would be sold by Canadian International's subsidiary, Riordon Sale Corp., Ltd.

Mr. Johnson said that plans call for integration of all woodland and production activities of the Brown properties with present Canadian International operations. The company presently has two newsprint and three dissolving pulp mills in Quebec and Ontario. A subsidiary, New Brunswick International Paper Co., operates a third newsprint mill at Dalhousie, New Brunswick.

This marks the first entry of Canadian International into the kraft field.

Douglas Fir Used In Harmac Pontoon Wharves

One of the largest floating pontoon wharves ever constructed on the Pacific Coast is being put into service at the Harmac pulp mill near Nanaimo, B. C. In two sections, the wharves were constructed by Timber Preservers Ltd. at their plant in New Westminster, B. C., and are 72 ft. in length by 40 ft. in width. Each unit floats on 28 individual box-like plywood pontoons.

The wharves were towed to the pulp mill site at Nanaimo and stationed parallel to each other 14 feet apart and a roof erected overhead, thus creating a massive floating shed to house splitter saws.

Logs will be floated between the wharves and split to various dimensions for handling in the manufacture of pulp.

Interesting point of this unique structure is the series of box pontoons built of Douglas fir plywood pressure treated with creosote. This creosote is the one preservative most disliked by the notorious toredo marine borer. Cedar logs commonly used for floats would be riddled with holes in two or three years in Nanaimo harbor. With creosote treated plywood pontoons it is estimated the wharves will have a life span of over 35 years.

The 58 plywood pontoons float independently within the stout creosote treated lumber framework and any single unit can be removed for repair should it suffer from excessive impact from floating logs.

Cedar logs, traditionally used for float supports on the Pacific Coast are costly and subject to fairly rapid deterioration due to toredo marine borers. Creosoted plywood box pontoons are expected to supplant the use of these logs in numerous applications including boathouses, marine gas stations, floating canneries, seaplane landing floats, ferry and boat landings and many other float uses in both fresh and salt water.

Albany, Ore., Mill Under Consideration

While the Willamette Valley Lumber Co. is admittedly interested in a paper manufacturing project which may be established near Albany, Ore., plans are as yet far from complete and whether or not such an industry will materialize cannot be determined for probably 30 days or more.

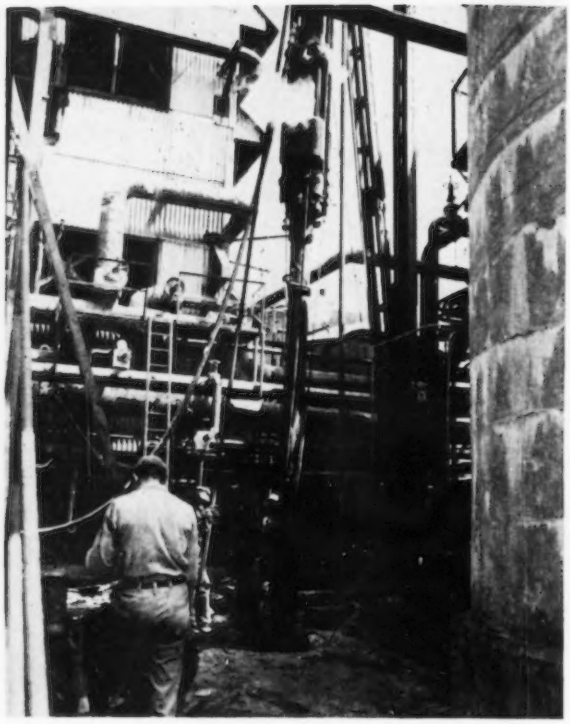
This in substance was a statement issued September 22 by William Swindells, Portland, Willamette Valley Lumber Co., manager.

Mr. Swindells' statement was prompted by reports published elsewhere that the plans were definite.

"It is true that we have been for several years and still are investigating the feasibility of establishing such an enterprise but we are by no means ready yet to make a definite announcement." He explained that a number of problems remain yet to be met and his company has thus far refrained from issuing a statement to save embarrassment both to the Willamette Valley Lumber Co., and local civic leaders who have been assisting in furthering the project, should it fall through.

Tentatively planned, it was learned, is erection of a paper or pulp mill on a site between Albany and Millersburg on Salem road.

No land has been purchased, Mr. Swindells said, and the construction plans are still indefinite.



ENGINEERING A TIGHT FIT close quarters on site of new water storage tank at Brunswick Pulp & Paper Co. (Ga.) made it necessary to drive the 12 Armco pipe piles without leads, in individual lengths of approximately 15 feet. Yet all piles averaging 50 ft. in length were driven this way with only three splices per pile. Design load was 70 tons per pile.

Rayonier Blamed for Fish Kill in Georgia

A fishing-park owner on the Altamaha River in Georgia has obtained an injunction against Rayonier, Inc.'s Jesup, Ga., plant. Under the injunction, Rayonier is forbidden to discharge anything into the river that is harmful to fish life. A public hearing on the injunction is scheduled for October 7. Meanwhile, the mill is operating at full capacity.

The background behind the action is that in September there was a heavy fish mortality in the neighborhood of a fishing park some 30 miles downstream from the Rayonier plant. The owner filed the injunction against the mill and it was granted without any evidence that the pulp mill was to blame. There were no dead fish found within six miles of the mill and only a scattered few within 10 to 15 miles. The heavy kill was 15 to 30 miles away.

The Rayonier plant produces dissolving pulp by the kraft process and has been in operation since late last spring. Included in the design is a 40-acre lagoon between mill and river which impounds all mill effluents before they are discharged into the river.

The sudden death of the fish in the Altamaha river is reminiscent of a similar event in the Kalamazoo river a year ago. In each case, there was no change in mill operations, but a very large number of fish suddenly died. Other similarities are that, in each case, the river was an all-time low level during a period of very warm weather. A severe drought is being experienced by the entire southeast, and instances of fish kills have been reported in Chesapeake Bay by the *Baltimore Sun* and at Umatilla, Fla., by the Jacksonville, Fla., *Times-Union*.

Equatic biologists and other technical men who are studying the problem for Rayonier, Inc., have suggested that the fish kill may have been due to a combination of natural circumstances, for none of which is the mill responsible. These include: low level of river; high air temperatures; severe showers just prior to the kill which flushed swamp water and sanitary sewage out of streams; strong algae growth in river, etc. There has been no evidence whatever to indicate that the mill is in any way responsible for the fish kill.

Advising Rayonier are Dr. Harry W. Gehms, technical adviser for National Council for Stream Improvement, and two of his assistants — Louis Freeman and Robert Opfercook; and Dr. Harry S. Swingle, Alabama Polytechnique Institute. Dr. Swingle directs the world's largest research facilities for the study of warm water species of fish.

Paper and Board Production

According to the American Paper and Pulp Association, the ratio of United States paper production to mill capacity for the week ending September 25, 1954, was 96.4 percent, compared with 92.1 percent revised, for the preceding week. The ratio was 98.2 percent for the corresponding week a year ago. Mills producing newsprint exclusively are not included.

The paperboard production ratio for the week ending September 25, 1954, was 92 percent, compared with 93 percent for the preceding week, and 98 percent for the corresponding week last year.

(Detailed statistics on page 38.)

Anglo-Canadian Granted Forest Option Extension

Anglo-Canadian Pulp and Paper Mills Ltd., has been granted an extension of its option on 2,000 square miles of Saskatchewan pulpwood forest near Prince Albert, Resources Minister J. H. Blockelbank said.

The company is controlled by Daily Mirror Newspapers Co., Ltd., of London.

The extension gives the company an additional three months on an option it has held for a year to complete investigation of pulp-milling possibilities there. The original option was to have expired September 30.

If the company exercises its option it must start construction of a proposed $30,000,000 mill by June, 1955, and spend $5,000,000 on plant work in the first year.

Victoria Paper Mills Reopen

"The Victoria Paper Mills resumed operations at Fulton, N. Y. on October 2nd on all machines.

Union employees are taking a voluntary 10 per cent pay cut to help keep the firm in business. Management announced it would reopen the plant after members of Local 519, CIO United Paperworkers Union, voted 91-22 to take less pay.

S. C. Hartman, vice-president, said, "The industry and Victoria's many customers have been most considerate of the company's situation and the company deeply appreciates their kind of understanding and indulgence."

Why Hide Our Light Under A Bushel?

Our industry needs a dynamic public relations program: this was the theme of a recent editorial in this magazine. We propose this week to examine and discuss some of the reasons why we need such a program.

1—Financing

Public understanding and appreciation of an industry make for less costly financing. One point on the sale of a $25 million bond issue means $250,000 more cash to the corporation. With the present promotion of, and interest in, Monthly Investment Purchase Plans, now is the time for our industry to acquaint prospective stock purchasers with the fact that ours is one of America's basic growth industries.

2—Legislation

Public appreciation of an important industry helps to prevent harmful legislation at all levels of government. Our legislators should be made well aware of our industry and its problems. This is better than to have to prepare briefs and send delegations with last minute information to prevent adverse governmental actions.

Our interests could easily be lost sight of by politicians, because of the moaning, groaning, beefs and squawks, boasting and bragging of other industries. It is the squeaky wheel that gets the grease.

3—New Blood

Public confidence and good will mean that better people are attracted to work in our industry. This applies to employees at all levels. Universities giving courses in pulp and paper manufacture tell us that they are unable to attract nearly as many students to these courses as they could handle and would like. A properly planned public relations program would help solve this problem.

4—Employee Morale

Our industry is so large and many of the jobs are so specialized that most employees do not have an appreciation of its importance. People work better and are more satisfied when they feel that they are working in a truly great industry.

5—Public Confidence and Goodwill

No industry can operate without public confidence and goodwill. In the highly competitive economic picture which makes up our country today, every industry must put its best foot forward. Of America's five largest industries — automotive, meat packing, steel, petroleum and ours — paper and board alone lack a national public relations program.

6—Socialism or Worse

Our industry is based on a capitalistic, competitive enterprise. This system is being critized in many quarters. Our system can only flourish in a democracy. It is our responsibility to convince all people in this country that ours is the best economic pattern. It is our duty, as corporate citizens, to defend and promote our democratic way of life.

7—The Forests

Our industry draws much of its raw material, pulpwood, from the forests which are a public heritage. The public deserves to be informed of how wisely we are using the forests and working for maintenance and expansion of them.

8—Stream Pollution

The public is unaware, or worse still, misinformed, of the efforts made by our industry to reduce contamination of our rivers and streams by mill effluent. Indeed, how many of our readers are aware of the fact that during the past 15 years, while the production of our industry has doubled, total stream pollution has been slightly reduced? In other words, the average pollution per ton of product has been reduced more than 50 percent.

Similarly, in other fields, we are not given credit for our progressive actions. Too often the credit for these goes to the Government, rather than to enlightened private enterprise.

9—Promotion of Our Products

Telling the story of our industry, and its growth, will help to promote the use of our products. The future of our industry lies, not in the use of paper as a cheap substitute, but rather in the use of paper because it provides the best product. The tremendous growth in the use of the corrugated shipping containers, and the multiwall paper shipping sacks, are outstanding examples. To us it may appear incredible, but the general public has no appreciation of the truly immense use of these products, or the manufacturing facilities which supply the demand.

The public should be advised of the development of new and improved papers and paper products in order to hasten their acceptance and expand our markets. Are we, as one prominent executive suggested to me, "Doing too well to give a damn?" or Are We Going to Do Something about it?

John C. Evans

Alton Box Board Announces New Straw Process

Alton Box Board Co. announce that they are producing a new corrugating medium "Cor-U-Cel" by a revolutionary process developed by the company. It was stated that the new straw gives a product with . . . "qualities never before attained in a corrugating medium, no matter what the source of its fibers."

Company representatives state that the secret of the improved corrugating medium lies in the unusually high pentosan content in the straw pulp obtained by the new process.

In the new process the straw is first cut in a hammermill and then cleaned of fine debris by means of air. The existing straw digester house was converted to the new process and new washing and refining equipment installed.

The new corrugating medium is produced on a new Beloit fourdrinier machine which replaces a cylinder machine previously used for nine point manufacture.

Celanese Unveils New Cellulose Fiber to Compete with Synthetics

Celanese Corp. announced this week production of a new textile fiber called "Arnel." The company claims that the new fiber will compete directly with such synthetics as Orlon, Dynel, Acrilon, etc., but will be much lower in cost.

The new fiber is spun from cellulose tri-acetate, which uses wood pulp as a raw material.

Hudson Pulp & Paper Issues 2nd Pfd. Stock

A 200,000 ($4.9 million) share block of Hudson Pulp & Paper Co. 2nd preferred stock is on the market this week.

Proceeds from the sale of this stock plus $4 million from a private sale of preferred stock are to be used to help pay for a new paper machine installation at the company's Palatka mill.

Fibre Box Assn. Elects

Convening in annual session at the Waldorf-Astoria Hotel, New York, on October 4 and 5, the Fibre Box Assn. named Norbert G. Rennicke, president, and W. L. Davis its vice-president. Also elected by the assembly were 33 new directors.

Mr. Rennicke is president of the Atlas Boxmakers, Inc., Chicago, Ill. Mr. Davis is president of Hankins Container Co., Cleveland, Ohio.

Atlanta Paper Co. Plans New Warehouse

The Atlanta Paper Co., Atlanta, Ga., will add a $350,000 fire resistant warehouse to its plant. The one-story building, to be located at 1010 Marietta St., NW, will occupy 106,304 square feet. The Griffin Construction Co. has the building contract.

Calcasieu Strike Ends

The two-year struggle between the management of Southern Industries, Inc., and Calcasieu Paper Co. and two AFL unions is over.

The strike ended as a result of 673-18 vote by non-union workers not to accept the International Brotherhood of Pulp, Sulphite and Paper Mill Workers and the International Brotherhood of Papermakers at the mill as their bargaining agents.

Union officials, in ending the strike, blasted what they said were "unfair practices and deplorable working conditions" at the two plants.

The strike, which brought national attention with its 180 acts of violence, started September 12, 1952. All union members walked out. But the plants reopened several months later with non-union labor and have continued to operate.

Dynamitings, shotgun blasts, fires and other acts of violence had occurred since the reopening.

The National Labor Relations Board supervised the September 30 election and under the Taft-Hartley law striking employees were not allowed to vote. (See page 9 of September 24 issue of *Paper Trade* JOURNAL.)

Paul L. Phillips, Albany, N. Y., president of the International Brotherhood of Papermakers, and Don P. Burke, Fort Edwards, N. Y., president of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, issued a statement calling off the strike.

They said the NLRB broke "all previous precedent and ordered an election on the company's petition to decertify the union.

"In the face of the above odds, the atmosphere of state police, armed guards, court injunctions, mass evictions, the suffering and sacrifice of these employes, fighting for the principles they believe are right, have proved in vain."

The statement said all local unions and all of their members were advised to disband picket lines and seek other employment. The officials added they were informed the advice would be followed.

Controlled, Cleaning of Pulp Subject of Patent

A United States patent for a method of improving dissolving woodpulp, the work of Kenneth R. Gray, Shelton, Wash. has been assigned Rayonier Incorporated. The patent is entitled, "Improved Refined Wood Pulp and a Method of Improving It."

Mr. Gray explains that one of the chief reasons for purifying or refining dissolving pulp is to remove as much as possible of the impurities so that there results a whiter and purer pulp which is capable of producing a higher grade of yarn when manufactured into rayon.

According to Gray, not all of these impurities are undesirable from the standpoint of viscose processing; and, in fact, some of them, that are normally present in small amounts, have beneficial effects.

Therefore, in theory, the problem is to remove all of the undesirable impurities while retaining in suitable amount those which facilitate subsequent processing steps. But, in practice, such a clean-cut separation is difficult to accomplish directly. Consequently, in his invention, Gray discloses a practice in which all or most of the impurities are removed and small amount of certain materials are then incorporated in the refined pulp to achieve the desired beneficial results.

In his patent specifications, Gray describes in detail the composition of his additives; and he also cites some of the advantages that accrue from his practice. Thus, for example, it completely eliminates or substantially reduces the scums that normally have collected in various lines and tanks of the viscose apparatus and have caused interior or spoiled yarn.

In addition, it is advantageous in the preparation of brigat viscose; and it renders possible the production of a uniform refined pulp regardless of the many different kinds of wood from which it originates.

Hills Heads Powell River's Planning Div.

Powell River Co. Ltd. has appointed George B. Hills, Jr. as director of planning. Mr. Hillis, formerly executive assistant, will head the newly-created Planning Division which is responsible for the formulation of long-range plans for the company and its subsidiaries.

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Recent Mill Developments in Cyanamid Paper Chemicals...

INCREASED WET-STRENGTH EFFICIENCY is credited to Sodium Phospho Aluminate when used in conjunction with PAREZ® Resin 607. One mill experience in the Great Lakes area shows that wet strength is increased as much as 10% when 0.2-0.4% of SPA is added to the beater.

* * *

UNUSUALLY GOOD SIZING RESULTS are reported by a Pennsylvania mill using CYFOR® Dry Dark fortified size. After switching to CYFOR, this mill obtained a 17% reduction in water absorption as measured by the Cobb test.

* * *

CONSIDERABLE SAVING IN A LARGE-SCALE COATING operation is credited to the replacement of stearate by ALWAX* Size 204-A. The Wisconsin mill noted that the increase in viscosity was less pronounced than with stearate, and that the smoothness of the coated paper was just as good as that obtained by using 6% stearate. These results were secured at considerably less expense.

* * *

IMPROVED PICK TEST ON OFFSET PAPERS was achieved by the use of 0.25% of PAREZ Resin 607 added at the sand trap. This was made standard procedure at this midwest mill, which also reports no broke reclamation problem due to the small amount of resin involved.

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The 25 Year Demand for Pulpwood, Pulp and Building Boards

We present here the sections on pulpwood, pulp and building boards from Weyerhaeuser Timber Co.'s summary of the report, "America's Demand for Wood 1929-1975." Weyerhaeuser retained Stanford Research Institute of Stanford University to prepare this market research report on wood and wood products. The company is not holding the report for its own exclusive use, but is making it available to the entire industry.

The largest consumer of wood pulp is paper. In 1953, the total output of paper was about the same as paperboard, but the wood pulp requirements per ton of product were almost twice as great. As a result, about 54 percent of all wood pulp consumed was taken by the paper industry, as compared with about 33 percent by the paperboard industry. Wood pulp requirements for building papers and building boards, not included in the above figures, represented almost 9 percent of total wood pulp consumption. The remaining 4 to 5 percent of wood pulp consumption is attributed to dissolving pulp uses.

Paper and Paperboard

Paper and paperboard consumption estimates are shown in the table below, built up from estimates of consumption of individual types of each:

	Millions of Tons				
Product	*1952*	*1960*	*1965*	*1970*	*1975*
Total Paper	16.9	20.8	23.3	25.8	28.0
Total Paperboard	12.1	16.6	19.4	22.1	24.9
Total Paper and Paperboard	29.0	37.4	42.7	47.9	52.9

Paper consumption, as measured by new supply (production plus imports, less exports), increased about 93 percent between 1929 and 1953, rising from 9.1 to 17.6 million tons. Consumption of all papers by 1975 is estimated at about 28 million tons, based on correlation with population, real disposable income, and trend; this checks reassuringly with the total estimates for each of the paper types.

Consumption of all grades of paperboard, as measured by changes in new supply, has risen rapidly in the past quarter-century from about 4.3 million tons in 1929 to about 13.8 million tons in 1953. A continued increase is expected, but at a lesser rate. It is unlikely paperboard can find new uses as potentially large as shipping containers and packaging materials. A slower rate of growth, therefore, is reflected in an estimated future consumption of 24.9 million tons of paperboard in 1975. This estimate is based on a separate correlation of total paperboard consumption with population, real disposable income, and trend. The sum of the estimates for individual types of paperboard also provides the same estimate of total paperboard consumption by 1975.

To arrive at an estimate of production requirements in the United States in each of the future years, it is necessary to make allowances for net imports of paper and paperboard. In 1952, net imports totaled 4.6 million tons, with newsprint imports of 5 million tons partially offset by net exports of other grades. Heavy imports of newsprint are expected to continue; this country will remain a net importer of paper and paperboard. Net imports are estimated to reach about 6.3 million tons by 1975.

Total domestic production of paper and paperboard is expected almost to double, from 24.4 million tons in 1952 to 46.6 million tons by 1975. A summary of this production, by major paper and paperboard categories, is shown in *Table I.*

Pulp Uses Other Than Paper and Paperboard

Of the 800,000 tons of wood pulp used in products other than paper and paperboard in 1952, the most important con-

Stanford Research Institute

Stanford Research Institute is a nonprofit corporation affiliated with Stanford University. It was founded in November, 1946, by the trustees of Stanford University, at the request and with the support of leading West Coast industrialists. Applied research services are provided by the Institute on a contract basis to business, industry, and government in three broad fields: engineering, physical sciences, and economics. The research team for a particular project may cut across organizational lines. While the Institute's economic studies have given primary attention to its home territory — the eleven western states — its domestic range includes the whole United States.

TABLE I

Domestic Production of Paper and Paperboard

(Millions of Tons)

Grade	*1952*	*1960*	*1965*	*1970*	*1975*
Total Paper	10.9	13.6	15.4	17.1	19.0
Fine	1.3	1.6	1.8	2.0	2.3
Newsprint	1.1	1.3	1.5	1.6	1.7
Book and other printing	3.4	4.2	4.8	5.4	6.0
Coarse	3.2	3.8	4.2	4.6	5.0
Sanitary, tissue and other	1.9	2.7	3.1	3.5	4.0
Total Paperboard	10.9	14.5	16.8	19.0	21.3
Containerboard	5.8	7.4	8.5	9.6	10.7
Boxboard and other	5.1	7.1	8.3	9.4	10.6
Building Paper and Paperboard	2.6	3.9	4.7	5.5	6.3
Building paper	1.3	1.8	2.1	2.4	2.7
Building board	1.3	2.1	2.6	3.1	3.6
Totals	24.4	32.0	36.9	41.6	46.6

suming industry was rayon and acetate, which took 61 percent. The remaining 39 percent was used for cellophane, lacquers, photographic film, plastics, and explosives.

Most important growth area in the rayon and acetate industry has been in high-tenacity filament yarn. This growth has been greatly due to the tire cord and fabric market. From less than 1 percent of this market in 1937, high-tenacity rayon rose to 64 percent by 1950, and two years later it had taken about 77 percent.

Textile consumption of rayon and acetate declined in the latter part of 1953, reflecting not only growing competition from other man-made fibers, but also from cotton, which is gaining an increasing share of the apparel market as a result of new finishes and dyes. It is expected by 1975 rayon and acetate will be about 23 percent of mill consumption of fibers, compared with 18.9 percent in 1952. This indicates a declining rate of growth for rayon and acetate in the textile industry. Past and expected shifts in textile markets are shown in Chart III and the accompanying table.

Wood pulp consumption in other products has increased from about 70,000 tons in 1939 to about 308,000 tons in 1952. It is estimated total pulp consumption in these other uses will increase to about 600,000 tons by 1975.

Total non-paper uses of wood pulp are expected to increase from 800,000 tons in 1952 to about 1,800,000 by 1975.

Wood Pulp Requirements

Wood pulp needed to produce the paper and paperboard shown on the previous page, together with quantities required for the production of other products, was estimated on both statistical and qualitative bases. All estimates provided similar answers, although the qualitative estimates, based on a detailed evaluation of each of the producing industries, were used for this study.

The qualitative estimate, based on the probable composition of the furnish* per ton of each of the major classes of paper and paperboard for each of the target years, shows that by 1975, 36.1 million tons of wood pulp will be consumed in all products, with 34.3 million tons required for the production of paper and paperboard alone. A detailed breakdown of wood pulp consumption by type of pulp and by use is shown in *Table II*.

Estimates of wood pulp consumption shown above are determined by multiplying the estimated production of paper and paperboard in the United States in each of the future years by the quantity of wood pulp per ton of product expected to be required, based on estimates of the composition of the furnish used.

Although average furnish composition is not compiled regularly by any trade association or public agency concerned with pulp and paper, and although considerable variation is known to exist in the furnish used by different companies, estimates of the average furnish by product were first made for 1952 and extended to future years, based on a detailed study of industry practice regarding furnish and yields by type of pulping process.

Estimates of the wood pulp required to produce a ton of paper and paperboard in future years are affected by the furnish used for each grade of paper and paperboard, and also by the product mix. Net effect of these factors indicates an industry-wide average of 0.73 tons of wood pulp per ton of paper and paperboard for 1975, compared with 0.708 tons in 1952. The quantity of wood pulp per ton of paper and paperboard in the target years is shown in the estimates in *Table III*.

Estimates of the type of pulp that will be produced to meet the requirements for paper and paperboard demand were made for each of the products shown in the table above. Probably the most important change anticipated is the increased use of semi-chemical pulps in the furnish of both paper and paperboard. There is every indication that semi-chemical pulping will prove to be a versatile procedure suitable for producing pulp usable in a wide range of products from many species, including hardwoods.

The proportion of bleached and semi-bleached sulphate pulp in the white pulp classification, which includes also sulphite and soda pulps, is expected to rise steadily. Technological improvements have made the sulphate pulps extremely versatile in end-uses, including most of the uses of the sulphite pulps, while maintaining and improving their high degree of flexibility in terms of wood sources. Little, if any, further expansion in capacity of sulphite and soda pulps is foreseen.

The changes expected in the composition of the furnish of the various classes of paper and paperboard are summarized below:

1—Fine papers: expanded use of semi-chemical pulps, displacing some white pulp, notably bleached sulphite and soda pulps.

2—Newsprint: development of the use of semi-chemical pulps, substituting in part for the white pulps (unbleached sulphite) and in part for the groundwood.

TABLE II

Estimated Consumption of Wood Pulp in the United States

(Millions of Tons)

Product and Type of Pulp	*1952*	*1960*	*1965*	*1970*	*1975*
For paper, paperboard and building materials. Total	17.2	23.1	26.8	30.3	34.3
Unbleached sulphate	6.3	7.4	8.2	9.1	10.0
White pulps[a]	6.3	8.7	9.2	9.9	10.7
Groundwood	2.6	3.5	4.1	4.6	5.1
Defibrated or exploded	1.1	1.7	2.5	2.6	3.1
Semi-chemical	0.8	1.6	2.6	3.9	5.2
Screenings, damaged, etc.	0.1	0.2	0.2	0.2	0.2
For all other products[b]	0.8	1.2	1.4	1.5	1.8
Totals	18.0	24.3	28.2	31.8	36.1

[a] White pulps include bleached and unbleached sulphite, bleached and semi-bleached sulphate and soda pulps.

[b] Primarily alpha and dissolving pulps.

TABLE III

Estimated Wood Pulp Consumption Per Ton of Paper and Paperboard Produced

(Tons)

Type of Product	*1952*	*1960*	*1965*	*1970*	*1975*
Paper					
Fine	0.85	0.85	0.85	0.85	0.85
Newsprint	1.05	1.05	1.05	1.05	1.05
Books and other printing	0.80	0.81	0.83	0.84	0.85
Coarse	0.99	0.99	0.99	1.00	1.00
Sanitary, tissue, and other	0.97	0.97	0.98	0.99	0.99
Paperboard					
Containerboard	0.67	0.68	0.69	0.71	0.72
Boxboard and other	0.35	0.37	0.38	0.39	0.40
Building Materials					
Building paper	0.35	0.37	0.39	0.42	0.45
Building board	0.90	0.91	0.93	0.94	0.95

3—Book and printing papers: increasing use of both semi-chemical and groundwood pulps, with both replacing some of the white pulp.

4—Coarse papers: limited use of semi-chemical pulp.

5—Sanitary, tissue, and other papers: no significant change.

6—Paperboard: expansion of semi-chemical pulp use, replacing mainly wastepaper, straw, and other non-wood materials, but with a limited displacement of sulphate.

Domestic Pulpwood Sources by Region

Table V shows the estimated sources of the domestic requirements shown above, broken down by regions, by hardwoods and softwoods and between logs and bolts and mill residuals.

TABLE VI

(Millions of Cords, Roughwood Basis)

Type of Wood	East	South	West	Total U. S.
Increase in softwood logs and bolts	—0.4*	6.8	1.1	7.5
Increase in hardwood logs and bolts	2.3	5.3	..	7.6
Increase in mill residuals	0.9	3.4	3.6	7.9
Total increase in pulpwood supply	2.8	15.5	4.7	23.0

* Decrease.

TABLE IV

(Millions of Cords, Roughwood Basis)

	1952	1960	1965	1970	1975
Pulpwood equivalent of wood pulp consumed	29.5	38.9	44.1	48.9	54.8
Pulpwood equivalent of imports of wood pulp	3.0	4.1	4.7	5.3	6.0
Pulpwood consumed in U. S.	26.5	34.8	39.4	43.6	48.8
Net imports of pulpwood	2.0	1.4	1.3	1.3	1.3
Requirements for domestic pulpwood	24.5	33.4	38.1	42.3	47.5

Pulpwood Requirements

The tabulation in *Table IV* shows the steps involved for computation of domestic pulpwood requirements for 1952 and each of the target years.

The changes from 1952 to 1975 shown in *Table V* can be summarized as shown in *Table VI.*

Although softwood logs and bolts accounted for 80 percent of domestic pulpwood production in 1952, they account for only about a third of the expected increase in total pulpwood production between 1952 and 1975. Most of the increase in softwood logs and bolts is expected in the South, reflecting the large forest holdings being developed by the pulp companies and the fast growth of pulping species.

The expected increased production of hardwood logs and bolts in the East and South reflects the new pulping processes to utilize hardwoods, the relative abundance of hardwood supplies in these regions, the importance of utilizing the whole forest crop in managed forests, and the expected reduction of imports of Canadian pulpwood in the East.

The six-fold increase in the use of mill residuals, from 1.5 million equivalent cords in 1952 to 9.4 million in 1975, is based on the potential supply of chippable material, and the probable economic feasibility of using it, in each region.

The potential annual supply of chippable material in the East between now and 1975 is estimated at about the equivalent of 2 million cords based on annual lumber production of 3.1 billion board feet of hardwoods and 2 billion board feet of softwoods under present industry organization. This is shown on the following page:

TABLE V

TABLE V—ESTIMATED DOMESTIC PULPWOOD PRODUCTION BY REGION AND TYPE OF WOOD, 1952-1975

(Millions of Cords, Roughwood Basis)

	1952			1960			1965			1970			1975		
Region	Total	Soft-wood	Hard-wood	Total	Soft-wood	Hard-wood	Total	Soft-wood	Hard-wood	Total	Soft-wood	Hard-wood	Total	Soft-wood	Hard-wood
Total U. S.	24.5	21.0	3.5	33.4	27.1	6.3	38.1	29.9	8.2	42.3	32.3	10.0	47.5	35.0	12.5
Mill Residues	1.5	1.4	.1	3.3	3.1	.2	5.6	5.0	.6	7.4	6.3	1.1	9.4	7.9	1.5
Logs and Bolts	23.0	19.6	3.4	30.1	24.0	6.1	32.5	24.9	7.6	34.9	26.0	8.9	38.1	27.1	11.0
East	5.7	4.0	1.7	6.3	4.0	2.3	7.0	4.0	3.0	7.6	4.0	3.6	8.5	4.0	4.5
Mill Residues	.02	...	.02	.1	.05	.05	.2	.1	.1	.5	.2	.3	.9	.4	.5
Logs and Bolts	5.7	4.0	1.7	6.2	3.95	2.25	6.8	3.9	2.9	7.1	3.8	3.3	7.6	3.6	4.0
South	14.5	12.7	1.8	21.1	17.1	4.0	24.1	18.9	5.2	26.8	20.4	6.4	30.0	22.0	8.0
Mill Residues	.1	.02	.08	.7	.5	.2	2.0	1.5	.5	2.8	2.0	.8	3.5	2.5	1.0
Logs and Bolts	14.4	12.7	1.7	20.4	16.6	3.8	22.1	17.4	4.7	24.0	18.4	5.6	26.5	19.5	7.0
West	4.3	4.3	...	6.0	6.0	...	7.0	7.0	...	7.9	7.9	...	9.0	9.0	...
Mill Residues	1.4	1.4	...	2.5	2.5	...	3.4	3.4	...	4.1	4.1	...	5.0	5.0	...
Logs and Bolts	2.9	2.9	...	3.5	3.5	...	3.6	3.6	...	3.8	3.8	...	4.0	4.0	...

Source: Stanford Research Institute.

From Eastern Sawmills with Annual Production of:	Yield of Chippable Material (Thousands of Equivalent Standard Cords, Roughwood Basis) Softwoods	Hardwoods
Over 10 million board feet	50	70
5 to 9.9	50	70
1 to 4.9	270	400
Less than 1	500	700
Total	870	1,240

The potential volume of chips from mills of sufficient size to utilize expensive barker and chipper installations economically is very limited. Also, about 60 percent of the present pulp capacity in the East is in sulphite and groundwood pulps. These are processes for which mill residuals show little promise. At least in the immediate future, chip utilization appears limited in this region.

However, as economical methods of collecting and chipping residuals from small and scattered mills are developed in other areas, it is probable that these methods will be adapted to eastern conditions. Thus a more rapid expansion of pulp use of residuals is expected in the 1960's, while by 1975 it is estimated that about 11 percent of domestic pulpwood production in the East will be in the form of chips.

The following table of potential supply of chippable material in the South during the early 1960's is based on expected annual production of 9 billion board feet of softwood lumber and 5 billion board feet of hardwood lumber, distributed among mills by size essentially as at present:

From Southern Sawmills with Annual Production of:	Yield of Chippable Material (Thousands of Equivalent Standard Cords, Roughwood Basis) Softwoods	Hardwoods
Over 10 million board feet	520	250
5 to 9.9	490	250
3 to 4.9	380	200
1 to 2.9	1,040	540
Less than 1	1,660	810
Total	4,090	2,050

Because a large number of small mills in the South produce lumber from small logs, chip utilization has been insignificant in the South. The possible availability of whole-log barkers that will be economically feasible for mills with capacities as low as 20,000 board feet per day (about 5 million per year) may make possible the utilization of a larger quantity of chippable material. Efforts are also being made to concentrate slabs with bark at pulpwood shipping points in the South for mass transportation to pulp mills. Although the small size of slabs has made the development of economical slab barkers difficult, such debarking appears feasible under some conditions. Separation of bark from the chips may also prove technically feasible, despite early disappointments with flotation systems.

The estimate of 700,000 equivalent cords of mill residual utilization by 1960 is based on the expectation that the majority of mills cutting more than 10 million board feet annually will be selling chips. A small quantity of chippable materials is expected to come from smaller mills. It is believed that, as experience is gained in collecting wood from slab concentration areas and as new techniques are developed, a continued rapid expansion of mill residual utilization will be possible during the 1960's.

The estimate of 3.5 million cords from mill residuals by 1975 represents more than half the potential supply in that year. In view of the scattered small mills that characterize the southern lumber industry, this is believed to be about the maximum utilization economically feasible.

The potential supply of chippable materials in the West, with a lumber production of 20 billion board feet annually and with about the same size distribution of mills as now, is estimated at about 8.8 million cords. This potential supply is also based on the assumption that either whole-log or slab barkers will be used for handling all the material. Nearly a third of this material is produced in mills cutting less than 10 million board feet of lumber annually.

On a regional basis, this chippable material potential is located as follows:

1—In the Douglas fir region of western Washington and Oregon, with an assumed annual lumber output of 10 billion board feet, 4.33 million cords are assumed to be available, plus an additional .33 million cords of pulp chips from the production of 3 billion square feet ($\frac{3}{8}$-inch equivalent) of plywood. About 40 percent of this material is produced in southwest Oregon, where there is little present pulp production capacity.

2—In the California pine and redwood regions, with an assumed annual lumber output of 5 billion board feet, 2.15 million cords of chippable material may be expected.

3—In the remainder of the West, including eastern Washington, eastern Oregon, and the Rocky Mountain area, with an assumed lumber output of 5 billion board feet annually, 2 million cords of chippable materials are estimated.

At present, most of the more economical sources of chips have been brought into use, although some further increases of chips from existing sources can be obtained through additional barker installations. It is believed that the most important source of additional chip use in the West will be attained through additional pulp capacity in other lumber-producing areas within the region.

It is probable that any substantial increase in residual utilization in the West over the 5 million cords estimated for 1975 could be attained only at rapidly rising costs. Furthermore, the achievement of this level depends on the location of new pulping capacity in the lumber-producing areas not now serving pulp mills.

Demand for Building Boards (Insulating Board and Hardboard)

Because building boards compete with plywood, their demand is discussed here, even though material requirements for building boards are included under paperboard.

Consumption of building board, as indicated by changes in new supply, has increased more than ten-fold since 1929, with the bulk of the increase coming since the beginning of World War II. The greatest relative increase has been in hardboard; about 16 times as much hardboard was consumed in 1953 as in 1929. Insulating board has also shown a healthy 700 percent increase during the same period.

Insulating Board Demand

Insulating board, which is known also as structural or rigid insulation, is produced from wood fiber and sugar cane bagasse. It is used as a facing material for interior walls and ceilings in a variety of forms including planks, tileboard, and sheets; it is also used on exterior walls as a sheathing material, or in some cases as an exterior facing material.

As an exterior wall sheathing material, insulating board accounted for about a quarter of the residential exterior wall sheathing market in 1953. In 1920, it accounted for only about 4 percent of

TABLE VII

(Millions of Square Feet—⅛" Equivalent)

Year	Construction	Furniture	Manufacturing	Household	Total
1926	n.a.	n.a.	n.a.	n.a.	5
1929	..	....	....	....	75
1933	..	....	....	....	70
1937	....	....	....	....	254
1941	..	....	....	....	365
1945	....	....	....	....	550
1947	....	....	....	....	745
1948	....	....	....	....	957
1949	..	....	....	....	533
1950	....	....	....	....	916
1951	..	....	....	....	801
1952	218	325	282	175	1,000
1960	531	425	400	240	1,596
1965	773	530	460	270	2,033
1970	1,003	650	570	330	2,553
1975	1,280	780	630	360	3,050

Note: "n.a." indicates not available. Source: Actual—U. S. Department of Commerce and Stanford Research Institute. Estimates—Stanford Research Institute.

this market. It is expected, because of the cost advantages of insulating board, that its share will rise to about 34 percent by 1975, largely at the expense of lumber.

Insulating board as a facing material for interior walls and ceilings is used in new residential construction, for maintenance and repair of residential construction, and in nonresidential building. In new residential construction, as reported by residential contractors in 1953, insulating board was used on about 2 percent of the interior wall and ceiling areas. This represents a decline from an estimated 7 percent of the ceiling facing market in 1929 and 3 percent of the interior wall facing market in the same year. For the additions and alterations market, however, it is easily handled by the amateur and provides a low-cost facing material for such uses as the conversion of attic space to usable living area.

Hardboard Demand

Hardboard is distinguished from insulating board by greater density and rigidity, harder surface, and greater resistance to impact. Its production has steadily increased.

The data in *Table VII* presents the available information on hardboard use, with projections to 1975:

Hardboard is used by the furniture and fixtures industry to an increasing extent in drawers, dresser backs, under plastic surfaces in dinette sets, and for table tops in inexpensive furniture built for hard wear. In the fixtures segment of the industry, it is widely used for displays, counters, and partitions.

Hardboard is being used more by the construction industry — both residential and nonresidential — because of its relatively low cost and adaptability to many uses. Estimates of the consumption of hardboard in new residential construction are given in *Table VIII.*

As an underlay material in new residential construction, hardboard accounted for about 2 percent of the market in 1953. It is expected that by 1975 hardboard will have about 8 percent of this market, in the face of stiff competition from plywood.

From about 1 percent of the interior wall surfacing market in 1953, hardboard is expected to reach 5 percent by 1975; in the ceiling surfacing use, hardboard is expected to increase from the present 2 percent to 8 percent of the market. Gains are also expected in the use of hardboard as roof sheathing and for doors, cabinets, and trim.

Hardboard in nonresidential construction is largely used for concrete forms and interior partitions forming permanent parts of a building. On the farm, hardboard is adapted to many uses, such as exterior wall covering, partitions, and bins. With hardboard expected to gain relative price advantages and enjoy continued product improvement, it is expected that the use of hardboard per dollar of nonresidential construction will continue to increase, and that by 1975 about 350 million square feet of hardboard might be consumed by nonresidential construction, as compared with slightly more than 100 million in 1952.

In manufactured products also, hardboard has become increasingly popular in motor vehicle bodies, signs, toys and play equipment, electrical panels, aircraft die stock, and a multitude of other products. It is likely hardboard usage will continue to increase more rapidly than the growth of these using industries themselves. Based on these factors and the estimated increase in industrial production discussed in Section I, it is estimated that hardboard consumption in manufactured products might reach 630 million square feet by 1975.

In the do-it-yourself market, hardboard use is expected to be big. Suitable for interior walls and ceilings, closet doors, furniture, work surfaces, portable partitioning, shelving, and many other uses, hardboard can readily be installed by amateurs, and it wears well. From about 210 million square feet in 1953, home consumption of hardboard can be expected to increase to about 360 million square feet by 1975.

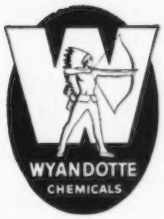
Total hardboard consumption in all uses is expected to increase from present levels of about 1.2 billion square feet to about 3 billion square feet by 1975.

Our readers may care to compare the predictions in this report with a modest economic study titled "What of the Paper Industry in 1979" by Howard Baumgarten in our July 2nd issue of this year.

TABLE VIII

(Millions of Square Feet)

Year	Floors	Ceilings	Roofs	Interior Walls	Millwork, Accessory Buildings and Miscellaneous	Square Feet	⅛" Equivalent
1950	25.0	....	....	....	3.5	28.5	34.1
1953	15.7	23.0	17.0	41.6	14.1	111.4	126.9
1960	43.7	53.3	37.9	95.2	33.4	263.5	298.4
1965	59.8	87.6	63.9	156.8	53.2	421.3	476.1
1970	60.5	114.0	92.7	231.5	72.2	570.9	644.6
1975	67.8	144.8	131.1	321.8	96.6	762.1	860.0



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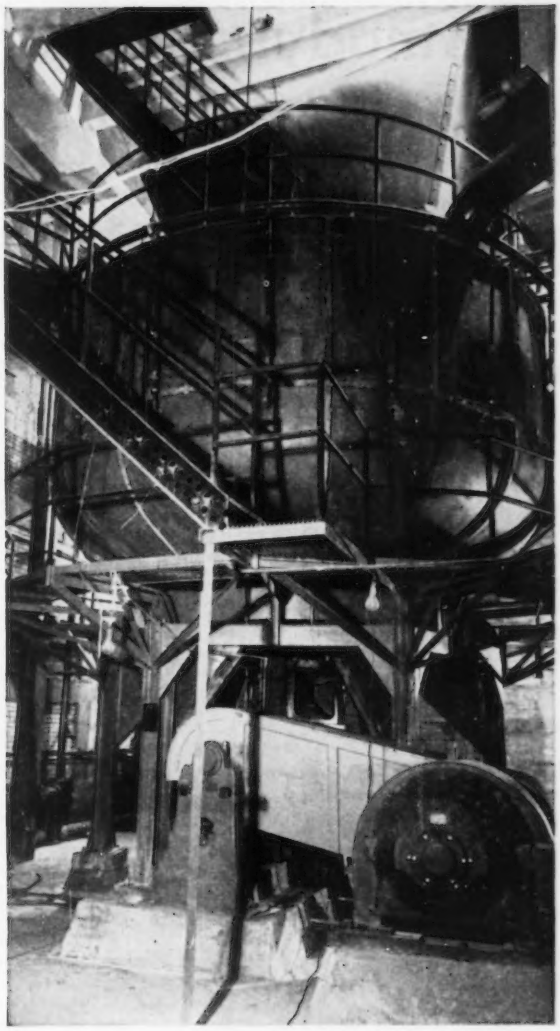

An 18' batch cooker-type HR Hydrapulper® at Kalamazoo Paper Company, Kalamazoo, Michigan. Caustic soda is used to loosen the bond of the ink to the paper, and form a carrying agent.

"We look to the chemical industry for three things," states B. H. Cooper, vice president, Kalamazoo Paper Company, Kalamazoo, Michigan. "One, a source of chemical raw materials; two, technical service and advice in handling chemical products; three, new chemical products to enable us to keep pace with progress.

"We do not confine our purchases to any one company. We have carefully selected sources from whom, we believe, we will get the greatest benefits during periods of both long and short supply. Wyandotte is one of our important sources for caustic and chlorine. Both their quality and services meet our requirements fully.

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Thermodynamics of Combustions of Sodium-Base Pulping Liquors

T. W. Bauer and R. M. Donald

The combustion of concentrated pulping liquors has become increasingly important in recent years as pollution controls make it impossible to simply dump spent liquors into streams and rivers. The heat of combustion may be recovered and has very attractive possibilities in high fuel cost areas, and chemical recovery is of special importance if an expensive base such as sodium is used in pulping.

Spent liquor combustion experiments are difficult to carry out because the large installation required in mill operation is almost impossible to duplicate on a laboratory scale.

Theoretical chemistry offers a way to calculate from thermodynamic considerations the equilibria involved in chemical processes from their free energy change. It is possible to predict which substances will be formed under certain operating conditions, and in what proportions, if the thermodynamic properties of the reactants and of the final products are known.

The thermodynamic properties of most of the substances involved in the combustion of sodium-base spent liquor have been determined and can be found in the chemical literature. A number of the values have been calculated in this laboratory, and some approximations for unknown values have been made.

The system involved in the combustion of sodium-base spent liquor is quite complex, involving 17 components besides the nitrogen and other inert gases present in air. The equilibrium constants of the reactions involved do not in themselves give a sufficiently clear picture and, therefore, the logarithmic equilibrium diagram method of Sillen and Andersson was used to give a more graphic description of the combustion process. Equilibrium diagrams for the gaseous and condensed phases were calculated and the relative amounts of substances were determined at five temperatures in the range from 800° to 1600°K. (527° to 1327°C.).

It is apparent from the equilibrium diagrams that sodium-base spent liquor will burn completely in an excess of oxygen, over a large range of furnace temperatures, giving mainly Na_2SO_4 and Na_2CO_3 as ash. Sulphur and sodium bound as sulphate are, however, undesirable products from the point of view of recovery of chemicals, and combustion in a deficiency of air, i.e. in a reducing atmosphere, is indicated. As the amount of oxygen is restricted, less sulphate is formed and more sulphur appears in the gas phase, at low temperatures as H_2S, at higher temperatures as SO_2. This too is undesirable, as it is difficult to recover the sulphur gases from the stack gas because of the large excess of steam, carbon dioxide, and nitrogen.

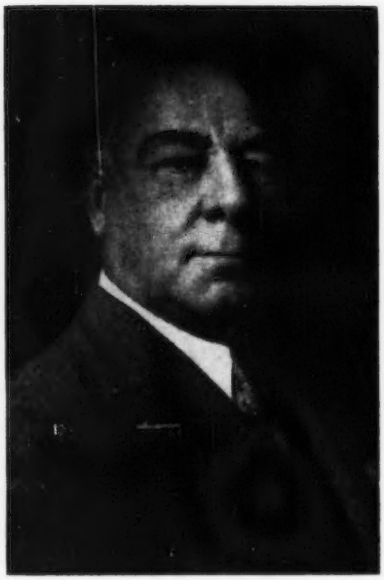
As the amount of oxygen is restricted further the sulphur loss in the gas phase begins to decrease again, and the condensed phase will be Na_2S rather than Na_2SO_4. This is the state of affairs best suited to chemical recovery and the sulphur loss in the stack will decrease as less oxygen is admitted to the combustion. A lower limit for the oxygen admitted is given by the point where the spent liquor will no longer burn completely leaving a char in the furnace.

At low temperatures (below 700°C.) it is impossible to admit enough oxygen for complete combustion without causing a high sulphur stack loss. At higher temperatures this difficulty is avoided, but high vapour pressure of metallic sodium in the furnace will cause high fly-ash losses. The presence of metallic sodium vapour in the furnace is the reason for the rather puzzling fly-ash loss at temperattures below the boiling points of the components of the fly-ash. The metallic sodium vapour will, of course, recombine with the stack gases to form Na_2SO_4 and Na_2CO_3 as soon as the temperature falls, leaving only about 1 part in 10,000 uncombined when the temperature has fallen 400°C. below the reaction temperature.

For these reasons furnace operation will be restricted to a temperature range from about 850°C. to 1200°C. with an oxygen deficiency of from 7 to 2 per cent. The optimum point of operation would appear to be near 1100°C. and 2 per cent oxygen deficiency.

A summary of an article which appeared in the May, 1954 issue of the Canadian Journal of Technology.

OBITUARY



Henry F. Harrison, a former vice president and director of West Virginia Pulp and Paper Co., died September 27 in Greenport, L.I.

He first became associated with the company 63 years ago. He was a member of the board of directors for 19 years and vice-president for four years. His knowledge of the industry and ability in the sales field contributed much to the growth of the company.

Mr. Harrison began his business career in 1882 as an office boy at the West Virginia Central & Pittsburgh Railroad, Piedmont, W. Va. He took his first job with the company in 1891 as an office assistant in the original mill at Luke, Md., three years after it was organized in 1888. He was transferred to New York when the company opened an office there in 1894, and after rapid progress in the sales department, became sales manager in 1904. In 1941 he was made a vice-president, a position he held until his retirement in October, 1945. He was elected to the board of directors in 1935, continuing as a member up until this year's annual meeting in March.

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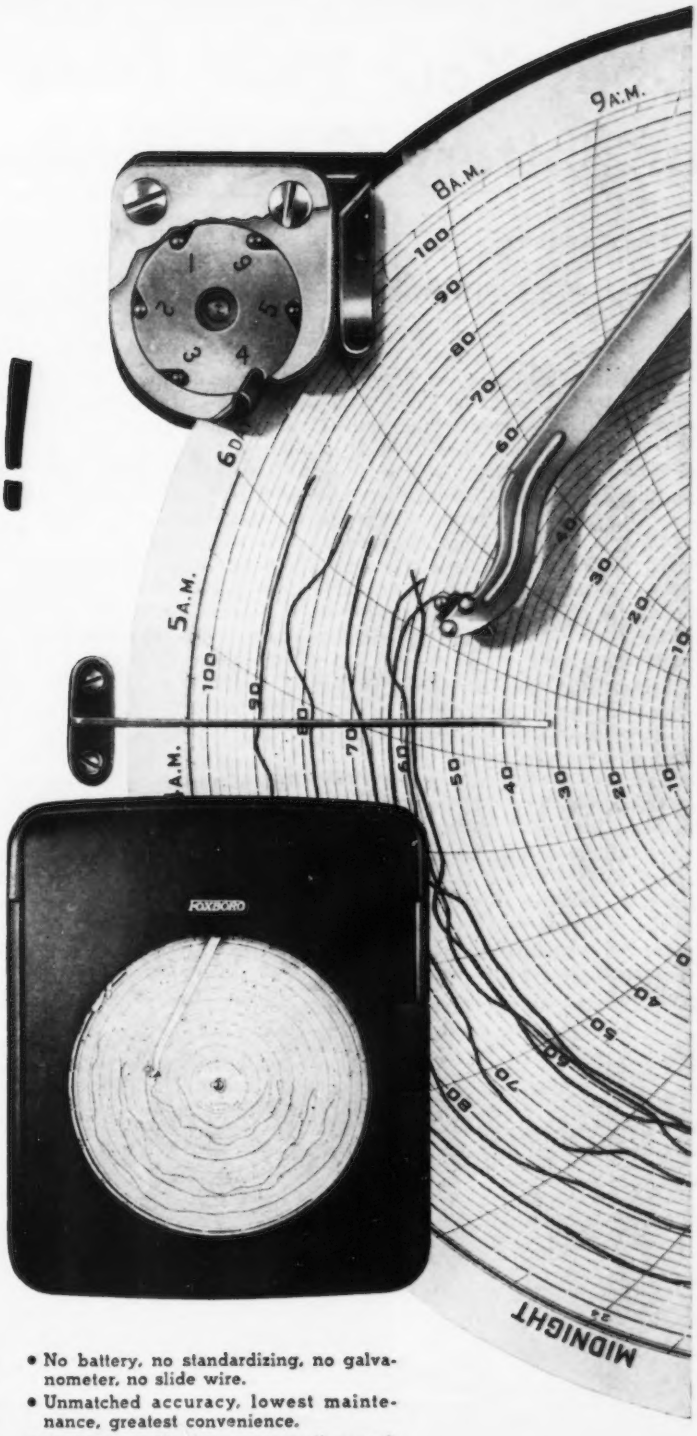

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FACTORIES IN THE UNITED STATES, CANADA, AND ENGLAND

Does Your Plant Observe These Rules of Battery Operation?

K. A. Vaughan

Manager Field Engineering, Gould-National Batteries, Inc., Trenton, N. Y.

Capacity

Batteries for cycle duty, as in electric fork-lift trucks, should be specified according to the capacity-recommendations of the manufacturer of the equipment to be served. There is often a tendency to substitute a smaller-capacity battery because superficial surveys indicate it will do the job. However, it must be remembered that the battery must supply power for peak-demand operations at any time during the shift and that extra uses invariably are found for battery-powered equipment.

Substituting a smaller battery almost always results in its being overworked which overdischarges the battery and results in lower efficiency. Over a period of time battery elements are inevitably damaged, with the result that maximum available life is not realized.

Availability of a sufficient number of spare batteries also is important. As a guide, 2.1 batteries per truck can be used as the minimum required for three-shift operation, provided available charging equipment can recharge each battery in eight hours.

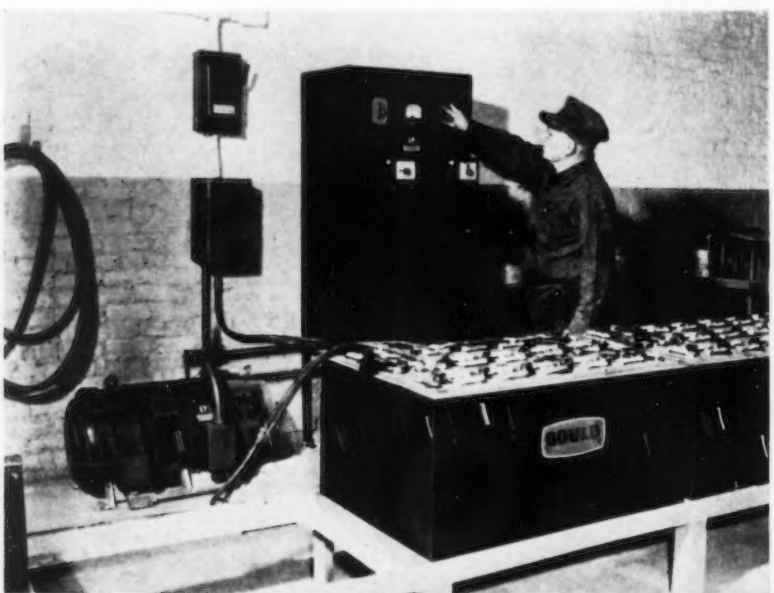
Instructions and Authority

Put one man in complete charge of battery operations, to centralize authority and responsibility. He should be well versed in battery technology and understand charging and maintenance procedures. The few safety rules applicable to storage batteries should be known and observed.

Some battery manufacturers conduct schools for customers' employees, maintain capable field engineering staffs that are available for consultation on battery problems and publish helpful manuals.

Inspections

The simplest way to keep cycle-duty batteries at maximum efficiency is to establish a periodic maintenance and inspection schedule. The battery should be cleaned from once a day to once in several weeks, depending upon the atmospheric and other conditions under which it operates. Vent plugs should be in place and tight. Water must be added to replace that lost by evaporation once every one or two weeks when the battery is in full cycle service.



Battery room personnel must be familiar with charging equipment and techniques. Charging equipment connections, meters, clocks, relays should be checked periodically.

The specific gravity and voltage of each cell of the battery should be checked at least once every three months, preferably once a month, after an equalizing charge.

Records

Records of all charging and maintenance activities for cycle-duty batteries should be made and filed to form a case history of the battery. Identify each battery and truck by number. Such records show which batteries are being abused or are wearing out, and make it possible to take steps to correct abuses or replace units in time to prevent production stoppages. From these records troubles in operating equipment, charging equipment and charging schedules often can be diagnosed.

Also, the men handling battery maintenance are more conscientious if they are required to record such data as: date of charge; time; amperes; specific gravity at the beginning and end of charge; addition of water.

Overdischarge

A battery must not be overdischarged, if maximum life is to be attained. Although occasional overdischarge has no harmful effects, if continued, it will harm the plates of the battery and shorten its life. In addition, when a battery nears complete discharge, its operating efficiency decreases.

Overcharge

A cycle-duty should not be overcharged, because this results in gassing and overheating. Gassing causes loss of water from the electrolyte. The practice of consistent overcharging will permanently damage some of the elements of the battery.

Boost Charge

Boost charges occasionally are necessary when trucks are doing extra-heavy work, or working extra hours. To prevent overdischarge of the battery, a brief charge is given during a lull in the work cycle (say, during the lunch period) to prevent unnecessary downtime of the truck.

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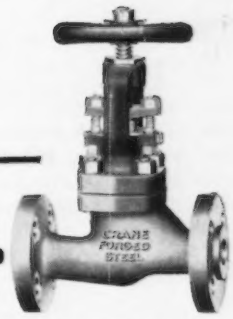
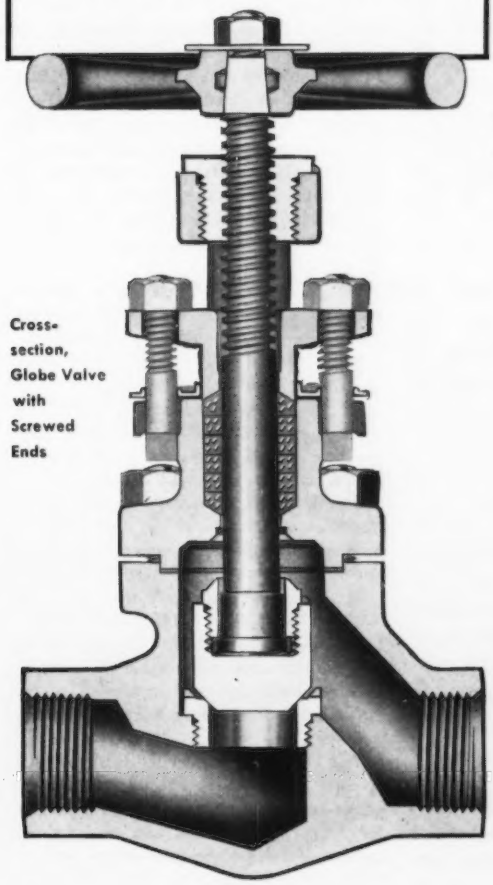


Flanged Ends
Globe and Angle Patterns

Screwed Ends
Globe and Angle Patterns



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Equalizing Charge

An equalizing charge should be given to cycle-duty batteries at least once a month, but not more often than once a week. This is an additional charge of three or four hours at the finishing rate of the battery. The purpose is to make sure all cells are brought up to full charge.

Charging Stations

Considerable savings can be made in overall plant operation if charging stations are located strategically. In large plants, it can be advantageous to situate small charging stations in outlying departments.

If central charging is used, the charging station should be situated so that all trucks have approximately equal distances to travel for charging.

Central charging has the advantage that it is more easily supervised. If conditions call for spot charging, proper supervision is extremely important.

In some plants charged batteries are delivered to the equipment instead of having the equipment come to the charging room. The charged battery is placed in the fork-lift truck and the discharged battery is returned to the charging room.

Schedule

It is particularly advantageous to schedule charging operations where a large fleet of trucks is employed, or where more than one shift is worked. By assigning each truck a certain time to report for charging, a backlog will not pile up at the charging room and truck downtime will be minimized.

Control Charging

Although charging equipment today is largely automatic, it must be correctly set for the size of battery charged. If a voltage relay timer governs the charging period, it should be inspected frequently to be sure it is in good operating order.

If the ampere-hour method of controlling the charge is used, charging men must be thoroughly familiar with ampere hour-meter charts and utilize them correctly. Otherwise, the battery will be either overcharged or undercharged.

Are you using the best method of charging for your size, location, type of service?

Inspect Meters

An occasional check-up of all charging equipment, ammeters, and voltmeters should be made. Although serious inaccuracies in this equipment will show up during charging, small inaccuracies can go unnoticed and over a period of time will lead to less efficient charging.

Idle Battries

Batteries that are stored for a period of time should be given a freshening charge once every three months to keep them in a fully charged condition. If this is not done, the battery eventually will discharge itself by internal action and a lead sulphate film will form on the plates. If allowed to remain, this film will harden and impair the efficiency of the battery when it is put in use.

Repairs

Although seldom required, battery repairs are sometimes necessary because of cracked containers, internal shorts, or rough handling. When inspections reveal a damaged cell, repairs should be made immediately, both to prevent further damage and to bring the battery back to maximum efficiency. If damaged cells are not replaced at once, the battery does not deliver full capacity and the other cells must stand harder duty to make up for those that are defective.

The battery room foreman should be familiar with repair techniques. A small supply of spare parts, such as jars, covers, and connectors, should be kept on hand together with the proper instruments and tools

Replace

Efficiency drops rapidly after a cycle-duty battery has been in service so long that it delivers less than 85 per cent of its rated capacity. When this point has been reached, it is advisable to replace the battery, to prevent work stoppages, avoid extra charging operations and wasted power.

Battery Room Equipment

In addition to a small office for safekeeping of charging records, the battery room should have means of lifting batteries in and out of trucks. A set of standard and special tools and instruments for making battery adjustments and repairs should be available. Spare parts to get damaged cells back into service quickly will usually pay off. Water and compressed air for cleaning are useful. A source of distilled water, if local public water is not usable, is a must. Sulphuric acid of storage battery use is essential.

D. T. Neale

Schoettle Co. Under New Management

Heirs of Edwin J. Schoettle, of Philadelphia, have relinquished their interests in the Edwin J. Schoettle Co., one of the nation's oldest and largest folding box manufacturers, and its subsidiaries, according to Douglas T. Neale, president of the company. Ownership was acquired by Mr. Neale and principals of United Container Co., Kardon Box Co., and Philadelphia Container Co., all of Philadelphia. The deal involved about $3 million.

Douglas T. Neale, who will continue as president of the company, declared that there will be no change in management, personnel or established policies of the organization.

The Schoettle Co. founded in 1862, is recognized as one of the foremost folding box makers in the nation with present manufacturing facilities at 533 N. Eleventh street, Philadelphia. Its activities are national in scope and provides quality packaging for some of the best-known brand names in America.

Mr. Neale emphasized that the subsidiary companies — High Production Machine Co., Precision Manufacturing Co., and Crompton-Schoettle Co., Inc.,— will be continued and expanded under the new ownerships and his continuing guidance.

The company and its subsidiaries will operate independently of principals' other interests, he pointed out. Except for the obvious advantages gained through combined buying power and interchangeable facilities, the companies will completely retain their individuality.

Mr. Neale, widely known in the packaging industry, began his association with Schoettle as a salesman in 1929. He became a director of the company and sales manager in 1936. A year later he became vice-president and general manager. In 1944 and '45 he took a leave of absence to serve with the Navy, returning to become president of the Schoettle company and president-treasurer of the subsidiary affiliates.

NEWS OF ASSOCIATIONS

1954-55 Program For Lake States TAPPI

Plans are fairly well on the way to completion of the 1954-55 program of the Lake States Section of TAPPI. The Executive Committee and officers have arranged a series of six meetings which should be of interest to mills in this area.

The first of these meetings, scheduled earlier than usual so that it might include foreign visitors to the Institute of Paper Chemistry, was held September 23, at the Conway Hotel in Appleton. The topic was "The Principles of Screening System Design" by Dr. Borje Steenberg, of the Swedish Forest Porducts Research Laboratory.

The second meeting will be held November 9 at Marinette, Wis. This will include afternoon mill visits to Badger Paper Mills, Marathon Corp., or the Marinette Paper Co. The evening dinner will be at Riverside Country Club, following which there will be demonstrations prepared by the Ansul Chemical Co.

The third meeting will again be scheduled in Appleton at the Conway Hotel, on January 11. The subject will be "Chromatography for Control and Research in Pulp and Paper" with a lecture and demonstration by Edgar Dickey, Research Assistant at the Institute of Paper Chemistry.

A fourth meeting is scheduled for March 8, at Kaukauna, Wis. An afternoon visit to the Thilmany Pulp and Paper Co. will be followed by dinner at the Elks Club. An after-dinner program is being planned.

The fifth meeting is scheduled for April 12, at Appleton. Dinner will be at the Conway Hotel. Following dinner, presentation of the Clarence J. West awards will be made.

The sixth meeting will, as in the past, be a social get-together. The place and program on this are to be announced later.

Superintendents Local Meeting Dates

DATE	DIVISION	PLACE
Oct. 14	Miami Valley	Manchester Hotel Middletown, Ohio
Oct. 13-15	Southern & Southeastern Fall Meeting	George Vanderbilt Hotel Asheville, N. C.
Dec. 3-4	Pacific Coast Div. (Annual Meeting)	New Washington Hotel Seattle, Washington

TAPPI Local Meeting Dates

DATE	SECTION	PLACE
November (day indefinite)	(Joint, Miami Valley Supt.)	Biltmore Hotel Dayton, Ohio
Oct. 18	Chicago	Chicago Bar Assn. Chicago, Ill.
Oct. 18-20	Delaware Valley	Benjamin Franklin Hotel Philadelphia, Pa.
Oct. 19	Metropolitan District — Empire State	Fraunces Tavern Pearl and Broad Sts. New York, N. Y.
Nov. 4	Kalamazoo Valley	Hotel Harris Kalamazoo, Mich.
Nov. 9	Pacific Instrumentation	Bellingham, Wash.
Nov. 9	Lakes States	Riverside Country Club Marinetta, Wis.
Dec. 10	New England	Roger Smith Hotel Holyoke, Mass.

Hold Organization Meeting Of Chesapeake and Allegheny Paper Club

Prof. C. E. Libby of North Carolina State University, Raleigh, N.C., and R. G. Macdonald, Secretary of TAPPI, were the speakers at the organization meeting of the Chesapeake and Allegheny Paper Club, held at Richmond, Va., on September 17. Prof. Libby spoke of the experience in organizing the Empire State Section of TAPPI, of which he was one of the founders, and emphasized the desirability of building a local club program that would be helpful to its members and their companies in performing their regular work. He also stressed the part that a local club could play in promoting the professional growth of the younger paper technologists in its area.

Dr. Macdonald recounted some of the problems that other newly organized paper clubs had encountered, as well as outlining the historical background of TAPPI, and advised the new club on many matters such as by-laws, dues, meeting places, membership, and programs.

Thirty-two men attended the meeting, at which Robert B. Hobbs, National Bureau of Standards, vice-chairman of the steering committee, presided. The club voted to continue the present steering committee, of which John H. Symes, National Container Corp., is chairman, in office until a permanent organization is effected. The next meeting was set for November 19, at the Hotel Jefferson, Richmond, Va.

Interested individuals in the Maryland-Virginia-northern North Carolina area, who have not already been contacted by the Club, are invited to send their names to John J. Priest, membership chairman of the Club, Halifax Paper Co., Roanoke Rapids, N.C., to receive notices of future activities.

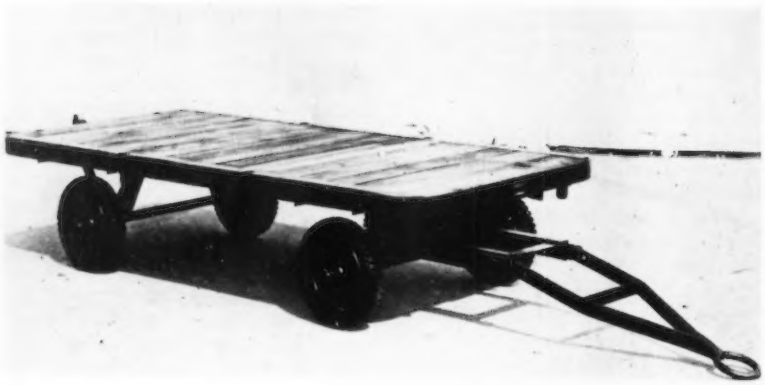
Fibrous Agricultural Residues Conference Cancelled

The TAPPI Fibrous Agricultural Residues Conference, originally scheduled to be held at the Northern Regional Research Laboratory, Peoria, Ill., on November 8-9, 1954, has been cancelled due to the illness of the chairman, Dr. S. I. Aronovsky.

Superintendents to Visit Ecusta Mill

A mill visit to the Ecusta Paper Corp., Pisgah Forest, N. C., is scheduled for October 15 as one of the features of the 1954 Fall Meeting of the Southern and Southeastern Divisions of The American Pulp and Paper Mill Superintendents Assn.

NEW EQUIPMENT AND SUPPLIES

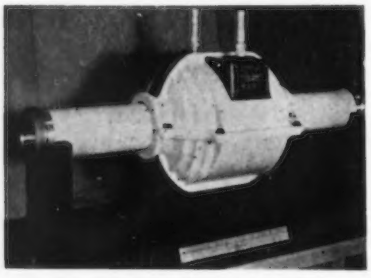


3-Ton Trailer

A 6,000-lb. capacity trailer, equipped with cushion type tires, has been developed by Mercury Manufacturing Co., 4044 S. Holsted St., Chicago 9, Ill. This trailer was designed for use over rough and uneven terrain, such as railroad tracks, broken concrete, road depressions, etc. Its cushion tires absorb load shocks, much the same as pneumatic tires, yet they are not subject to punctures, it is said. Designated Model A-660, the trailer, as illustrated, has a deck size of 48" wide and 96" long and is 21¼" high.

Both height and width of the deck can be varied to meet the user's requirement. Finished hardwood, 1-5/16" thick, is flush with the frame, thereby permitting loads to be slid on and off the trailer with ease. Wheels are equipped with Hyatt roller bearings and mounted on 1⅜" diameter axle. The cushion type tires are 16¼" x 4" x 11¼".

Longitudinal supporting angles are welded to a tee frame of 3" x 2½" x 5/16" dimensions. Attached to the fifth-wheel turn table assembly, which is of large area plate type, is a "V" type drawbar, with 4½" diameter loop handle which affords easy steering and maximum maneuverability. The rear of the trailer is fitted with a safety "C" type coupler. Stake pockets are located two on each side and two on each end at 29" centers. The number and position of the stake pockets can also be varied to meet the user's requirement.



Magnetic Flow Meter

An electromagnetic flow meter, designed for 2-inch to 8-inch flow lines, has been introduced by the Foxboro Co., Foxboro, Mass. Incorporating the advantages of electromagnetic metering, the instrument is rated for unlimited maximum flows, making practical a number of flow measurement applications impossible with ordinary metering equipment, it is claimed. Known as the Foxboro Magnetic Flow Meter, it will measure the volume flow rate of any liquid of sufficient conductance and velocity.

Said to be unaffected by the pressure, viscosity, density, or changes in conductivity of the flowing liquid, the meter is recommended for aqueous solutions, slurries, acids and other corrosives.

The unit consists of a nonmagnetic flow tube with an insulating liner containing flush-mounted metallic electrodes and surrounded by an AC electromagnet. When conductive liquid passes through the tube, an alternating voltage is set up between the electrodes which varies linearly in proportion to the rate of the flow. Lead wires from the electrodes transmit this voltage output to a new type electronic recorder, producing a chart record in appropriate units of flow.

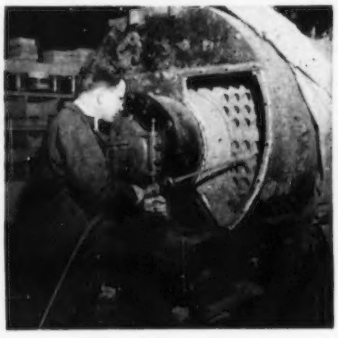
Over-all accuracy is within ± one percent of the scale span from maximum flow down to zero flow despite such factors as turbulence, dirty flow, etc., and the meter produces no more pressure drop than a length of pipe equivalent to the meter tube, according to the manufacturer. More details are available in a technical report, TI 27-A-71a, available from the company.

Versatile Cationic Agent

Cationic SP is a newly-developed cationic agent now available from New Product Development Dept., American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y. The material is currently offered as a 35 percent solution in an isopropyl alcohol-water mixture. A solid 100 percent active material will be made available in the near future.

Among the potential applications of this material in pulp and paper making, the manufacturer lists static prevention, removal of vat dyes from rag paper stock, pigment dispersal, emulsifying, rewetting of wet-strength papers, detergent action in hard water.

More complete data on its use and chemical properties are contained in the manufacturer's data sheet, obtainable from the company.



Boiler Cleaning Tool

Airnesco Boiler Cleaning Percussion Lance is a tool designed to provide quicker, more economical removal of combustion deposits in boiler tubes. Weighing only five and a half pounds, the lance converts compressed air or steam into a cleaning force that pulsates 1500 times a minute on the surface to be cleaned. The manufacturer is L. C. Nesham Products, 215 S. Third St., Allentown, Pa.

The amount of air or steam required to operate the lance is a minimum 20 cubic feet of free air per minute 100 p.s.i. or 110 pounds of steam per hour at 105 p.s.i. The unit is so designed that it automatically switches off the air when the plunger is released by the operator.

It is claimed that when inserted six inches into the tubes of Flame Tube boilers, the lance will clean the entire surface with three or four bursts of air or steam. Further report has it that it will clean a 300-tube Waste Heat boiler in 30 minutes.

Advantages —

1. **EASIER TO BURR**
2. **HOLDS PATTERN LONGER**
3. **MORE UNIFORM GRINDING ACTION**

IN mill after mill the new G Bond Norton Pulpstone is demonstrating these advantages. Many mills have entered repeat orders because they find that this stone gives them the highest quality, cleanest pulp for longest periods. It is another Norton improvement to help you meet today's competitive conditions. Ask your Norton pulpstone engineer about the new G Bond stone in ALUNDUM and 38 ALUNDUM* abrasives.

NORTON COMPANY, WORCESTER 6, MASS.
Norton Company of Canada, Ltd.
Hamilton, Ontario

*Shown in illustration above

NORTON
PULPSTONES

Making better products...to make other products better

Abrasives · Grinding Wheels · Grinding and Lapping Machines · Refractories · Porous Mediums · Non-slip Floors · Norbide Products

CUT YOUR BILLS TO

YOU GET MORE FOR YOUR DOLLAR WHEN YOU ORDER A SHIPMENT OF PEXOL FORTIFIED SIZE

There are many good reasons why Pexol outsells any other fortified size on the market. Not the least of these is Hercules' unequaled service facilities, which provide every Pexol user with the advantages of a product tailored to his needs. Hercules' technical representatives, trained for service to the paper making industry *exclusively*, are available to visit your plant, study your operating conditions, and recommend a Pexol formulation that will give optimum solubility, overall sizing efficiency and low foam index. Such service is a Hercules "plus"—insures the most for your sizing dollar *in actual use!*

FACTS ABOUT FOAM

There has been much comment about foam caused by rosin size. The simple fact is: **NO OTHER FORTIFIED SIZE HAS A LOWER FOAM INDEX THAN HERCULES PEXOL**, and at an equal degree of fortification no other size can even approach it.

RESEARCH FACILITIES

The finest research facilities possible, devoted exclusively to paper making chemicals and their application, are available in helping you improve your product or processing methods. Trained technicians in the laboratory back up Hercules' technical representatives in the field—put at your disposal over forty years of experience in solving paper making problems.

VARIETY

No one size, dry or paste, can possibly fit every requirement. That's why Pexol is available in both paste and dry forms, and in numerous types. Or, if your needs are unusual, Hercules will develop special modifications of existing formulations to meet specific conditions.

ECONOMY

Pexol brings reductions in size furnish . . . often as high as 30 to 50%. That means lower inventories, reduced freight and handling cost. Yet sizing tests are maintained . . . often improved. In every way, Pexol is a balanced fortified size that gives the most of all desirable properties—the most for your sizing dollar!

RESULTS

The final test of any size is how well it works for *you*. Pexol outsells all other fortified sizes. To maintain such a record, it *must* give results! If you're among the few who haven't yet tried Pexol, contact your Hercules technical representative. He'll be glad to demonstrate what you've been missing.

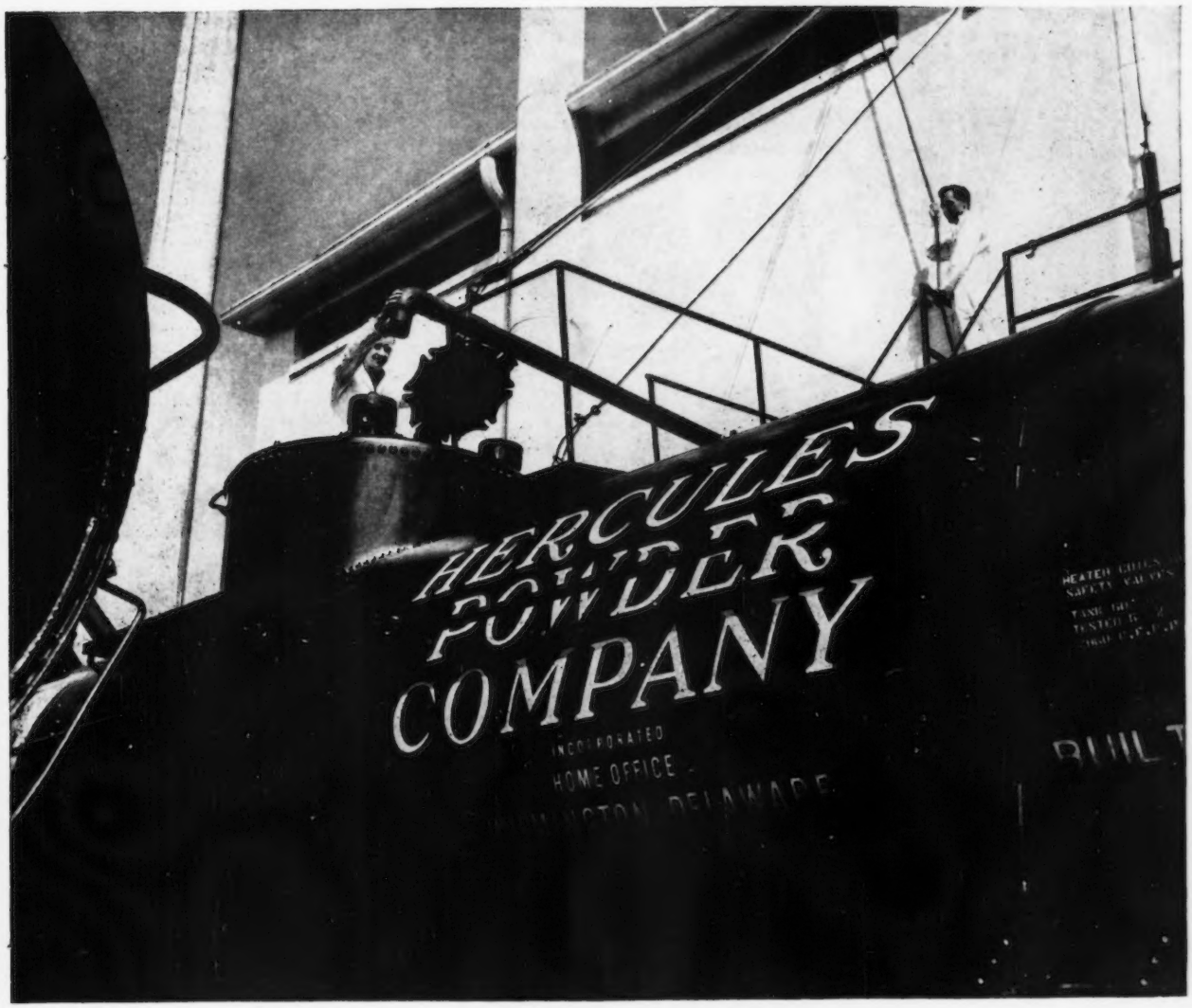
Paper Makers Chemical Department

HERCULES POWDER COMPANY

962 King St., Wilmington 99, Delaware

FOR OPTIMUM SIZING EFFICIENCY, SOLUBILITY, AND LOW FOAM INDEX . . .

SIZE WITH PEXOL

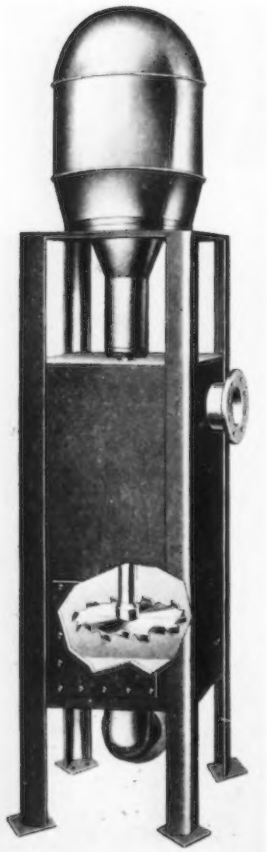


HERCULES

PEXOL®

FORTIFIED SIZE

PP54-8



Machine to Fiberize Screen Rejects

The Cowles Selective Defiberizer has been designed to fiberize screen rejects in pulp systems. A high-speed impeller performs the work. The machine is made by Cowles Co., Inc., Cayuga, N. Y.

The manufacturer claims that the machine will not touch waste such as cellophane, match sticks, foil, rubber bands, etc. Fiberizing is accomplished, it is said, without shortening the fibers. Also, since there is no mechanical grinding action or metal to metal contact, very little hydrating of the stock takes place. The machine is designed for continuous flow operation.

A single patented impeller of the type used in the firm's line of dissolving equipment runs freely in the stock and knocks down unfiberized rejects.

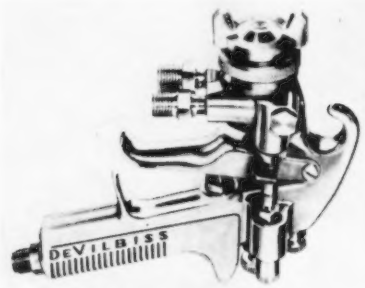
Cyanamid Adds Two New Colors to Its Stilbene Dyes

Two new colors have been added to its line of stilbene direct dyes, it has been announced by the Dyestuff Department of American Cyanamid Co., Bound Brook, N. J. Both dyes, Pheno Fast Yellow 8G and Pheno Fast Yellow 6G, were designed primarily for beater dyeing in the paper trade.

Both colors are bright green-shade yellows. Pheno Fast Yellow 8G is an extremely green-shade yellow, differing from anything previously available, according to the company.

Both dyes have suitable dyeing characteristics for napkin and tissue grade papers, and are alkali resistant, nonfeathering and produce more uniform paper, the company states.

Cyanamid points out that in making its own intermediates through improved processes, it has been able to maintain quality control in these dyes for paper. The company's major new dyes and improvements for the paper industry have been pointed toward obtaining the quickest and best color value in cold water in the quick pulping equipment now being used in the industry.



New Catalyst Spray Gun

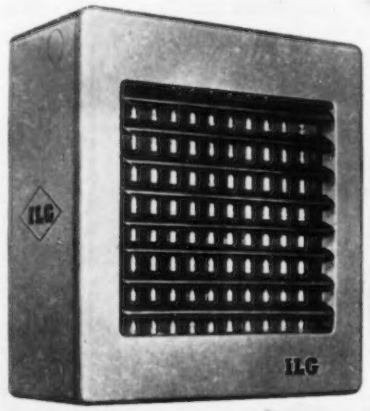
A completely new field of spray finishing is expected to be opened with the marketing of the DeVilbiss catalyst spray gun. Creation of the new gun is expected to speed resin development and formulations which have been retarded because proper application equipment was lacking. Designed to simultaneously spray plastic resin and catalyst, the new DeVilbiss gun is claimed to be the only one made which will assure a uniform mixture of resin and catalyst.

Before the advent of the new gun, the common practice was to mix catalyst and resin together in small quantities, speeding application before setting action took place in the spray gun fluid cup or in the gun.

This method is slow and also time consuming. With the new DeVilbiss gun, the resin is fed to the gun through the fluid line and the catalyst is introduced through the air stream. The gun has but one head. When the gun trigger is actuated, catalyst and resin meet outside of the air cap and are atomized uniformly so the correct amount is applied to the surface being sprayed.

To assure a uniform mixture, DeVilbiss engineers have installed a single pressure control for the resin and a double pressure control for the catalyst which is the governing agent in setting the resin. Dual atomizing air pressure control is also provided to insure uniform results regardless of main line pressure variation.

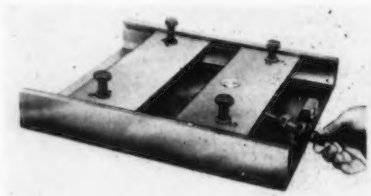
Further information about the gun, prices and delivery may be obtained by writing to the DeVilbiss Company, 300 Phillips Ave., Toledo 1, Ohio.



Improved Steam Heaters

A complete line of steam unit heaters to meet a wide range of heating needs in factories and offices has been introduced by Ilg Electric Ventilating Co., 2850 N. Pulaski Rd., Chicago 41, Ill. The heaters are available in 16 horizontal and 12 vertical types. Also available is a special model without fins designed for use in textile plants.

According to the manufacturer, installation of the new units has been simplified. Side entrance on the horizontal models provides four different pipe connection arrangements, each easily made and permitting maximum headroom. An improved louver arrangement assures efficient heat flow and all models are equipped with Ilg specially built, totally enclosed motors to drive the propeller fans. Further data are contained in Bulletin 349, obtainable from the manufacturer.



Adjustable Motor Base

To accommodate the necessary take-up of wide-range belts on wide-range, variable-pitch sheave installations, T. B. Wood's Sons Co., Chambersburg, Pa., has developed the Quick Slide Motor Base.

The base features a special provision for releasing the adjusting screw easily, thus permitting the motor to be moved freely and quickly after the base is bolted down.

Further details are contained in bulletin No. 497, obtainable from maker.

PEOPLE

W. A. Ketchen

A. J. Corey

Karl Patrick

W. H. Birchard

Changes in Fraser's Technical Dept.

Fraser Cos., Ltd., have made the following personnel changes in the technical department of the company and its subsidiaries, Fraser Paper, Ltd., and Restigouche Co., Ltd. W. A. Ketchen has been appointed to the new position of technical director and Dr. A. J. Corey succeeds him as chief chemist. Following these appointments, Karl Patrick has been named assistant chief chemist to succeed Dr. Corey and W. H. Birchard has been appointed chemical engineer, special assignments of the technical department.

Join Controllers Institute

Richard F. Cadwallader, assistant treasurer, Oxford Paper Co., New York, and James A. Patterson, comptroller, Eastern Corp., Bangor, Maine, have been elected to membership in the Controllers Institute of America.

The year 1954 sees Lindsay enter upon a second half century of service to the paper industry. We pledge our utmost effort towards making that period more and more resultful.
THE LINDSAY WIRE WEAVING COMPANY
CLEVELAND 10, OHIO
LINDSAY WIRES
Since 1904
FOR PAPER MANUFACTURING

V. H. Emory Named Mgr. of Mfg.

Vernon H. Emory was recently appointed manager of manufacturing, pulp and paperboard of Fraser Cos., Ltd., and its subsidiary, Restigouche Co., Ltd. In this position he has charge of and the general responsibility for the pulp and paperboard mills at Edmundston and the pulp mills at Atholville and Newcastle, New Brunswick. Prior to this appointment, a new position created by the company, he was manager of the Edmundston mills.

Mr. Emory was, for some six years, employed in the technical department of Abitibi Power and Paper Co., Ltd., Iroquois Falls, Ont., until January 1929 when he became mill chemist for Canada Paper Co., Windsor Mills, P. Q.

In June 1930, Mr. Emory joined Fraser Paper, Ltd., as a service engineer. Five years later he was appointed general superintendent of the Edmundston mills of Fraser Cos., Ltd., becoming their manager in 1941.

Mr. Emory is a member and past chairman of the Technical Section, Canadian Pulp and Paper Assn. and a member of the U. S. Technical Assn. of the Pulp and Paper Industry.

Paul M. Dunn

Oregon State's Forestry Dean Succeeds Recknagel At St. Regis

St. Regis Paper Co. announces that, effective January 1, 1955, Paul M. Dunn, presently Dean of Forestry at Oregon State College, will be appointed Technical Director of Forestry. Mr. Dunn succeeds A. B. Recknagel who retired December 31, 1953, but continues in a consulting capacity with St. Regis.

As Technical Director of Forestry, Mr. Dunn will make his headquarters at the St. Regis New York office. He will work closely with St. Regis forestry, woodland, and procurement personnel as well as with national and regional government forestry agencies and trade associations.

Bullard Transferred To West Springfield

Gordon Bullard of Turners Falls, Mass., sales manager at the Keith Paper Co. there for the past 15 years, has been transferred to the West Springfield office of the Strathmore Paper Co. The Keith mill was purchased by Strathmore last November.

Waters Co. Appoints Two Executives

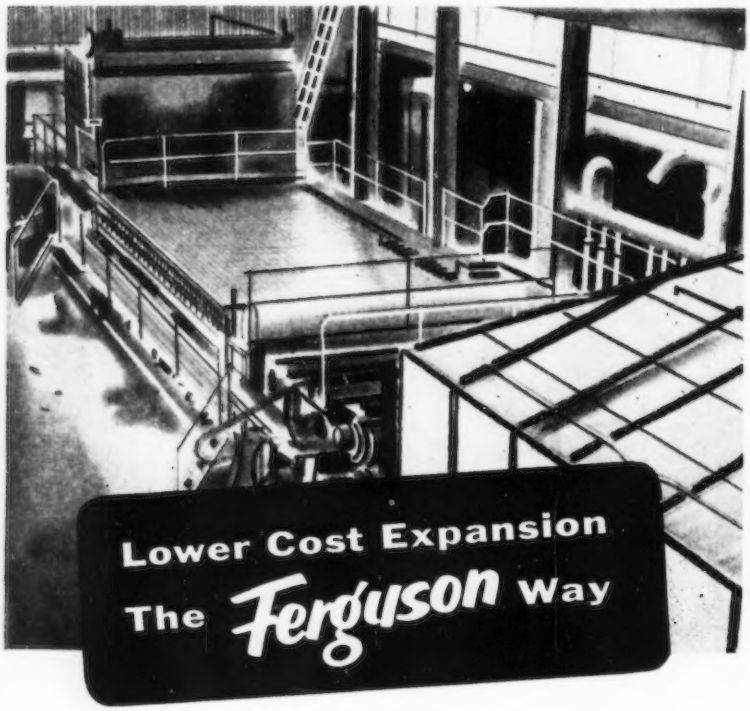
H. W. Andres has been appointed assistant vice-president of The Waters Co. He has been an employee of the company since 1942 and served in numerous administrative capacities. In his new position, Mr. Andres will direct purchasing and quality control, as well as special sales service and other administrative duties.

Joseph R. Carrier has been named sales manager of The Waters Co.

Mr. Carrier, who has been a manufacturers agent in the packaging field, has represented Waters selling folding boxes for the past seven years.

Effective September 15th, he served his other business associations to devote his entire time to the above position.

(More people on page 37)



Ferguson's ability to hold down costs in materials' purchasing as well as every phase of construction, assures you more for your pulp and paper mill expansion dollar.

From plans to completed plant, rigid control of the work keeps expenditures under predetermined appropriations. Our chief aim at all times is sound economic design and rapid construction.

THE H·K·FERGUSON COMPANY
ENGINEERS AND BUILDERS

EXECUTIVE OFFICES: Ferguson Bldg., Cleveland, Phone TOwer 1-6400 • NEW YORK: 19 Rector Street • HOUSTON: 2620 S. Main St. • CHICAGO: 1 N. LaSalle Bldg. • LOS ANGELES: 411 West 5th St. • CINCINNATI: 901 Enquirer Bldg. • SAN FRANCISCO: 55 New Montgomery St. MONTREAL: 1015 Dominion Sq. Bldg.

PRICES OF MATERIALS

Aluminum sulphate:			
cml. bags, c.l. wks.	cwt.	$1.85	/ —
iron-free, c.l. wks.	cwt.	3.55	/ —
Casein, acid prec.:			
dom. sh. pt. cl.	lb.	.27	/ .32
Arg. ex. dock, duty paid		.22½	/ .23
New Zeal, do.		.25	/ .26
Caustic soda:			
c.l. wks. solid, 76%	cwt.	3.85	/ —
flak. & grd. 400-lb. drums, c.l.		4.25	/ —
liquid 50% tanks		2.70	/ —
liquid 70% tanks		2.80	/ —
China clay:			
dom. air-float, c.l. wks.	ton	10.00	
water-washed, lump, filler	ton	11.00	
coating	ton	17.60	/30.50
Imported, ex. ship	short ton	16.00	/30.00
Chlorine:			
single-unit tanks, works	cwt.	2.93	/ —
multiple unit, 2-S cars per yr.		3.83	/ 5.00
Formaldehyde:			
USP, inh. dms. c.l. wks.	lb.	.0666	/ —
l.c.l., E. wks.	lb.	.071	/ —
Lime:			
hydrated bags, wks.	tons	14.50	/15.50
Gum rosin:			
Rosin size:			
K, M, N, drms, c.l. Savan,	cwt.	7.78	/ 7.80
70%, gum & pale grds., tank cars, south, sh. pt.	cwt.	6.55	/ 6.70
Salt cake:			
dom. bulk, 100% anh. wks.	ton	24.00	/26.00
imp. f.o.b. Saskatchewan	ton	16.00	/ {Cana. funds
Soda ash:			
light, 58%, bags, wks	cwt.	1.65	
bulk	cwt.	1.35	
Sodium silicate, 40° Be.:			
tank-cars, wks.	cwt.	1.00	/ —
drums, c.l. wks.	cwt.	1.35	/ —
42° Be. WW.			
tank-cars, wks.	cwt.	1.60	/ —
drums, c.l. wks.	cwt.	1.95	/ —
Sodium peroxide:			
dms. c.l. E. of Miss.	lb.	.186	
l.c.l. do	lb.	.191	/ .201
Soybean, protein:			
chem. isol., wks. c.l. bags.	lb.	.25	/ .25½
Sulphuric acid:			
60° Be. cbys. c.l. wks.	cwt.	1.75	/ 2.00
l.c.l. wks.	cwt.	2.30	/ 2.45
tank-cars, wks.	ton	16.30	/18.60
Sulphur:			
crude, c.l. mines, contract,	long ton	25.50	/27.50
f.o.b. vessels Gulf	do.	27.50	/30.50
Sulphur dioxide:			
liquid, coml. cyl., wks.	lb.	.09	
multi-unit cars	lb.	.0535	
Starches:			
corn, multiwalls, c.l. prod. plant:			
pearl	cwt.	6.39	/ —
white, dextrines	cwt.	7.78	/ —
chlorinated	cwt.	8.14	/ —
potato, Idaho, c.l. wks.	cwt.	6.75	/ —
East, fr. all. 50 cents cwt.			
potato, Maine, f.o.b. wks.	cwt.	{Nominal 7.25	/ —
Talc:			
domestic, sacks, c.l. wks.	ton	25.00	/30.00
Titanium dioxide:			
anatase, c.l. deld. E. bags	lb.	.22½	/ .23
l.c.l. deld.	lb.	.23½	/ .24
rutile, c.l. deld.	lb.	.24½	/ .25
l.c. deld.	lb.	.25½	/ .26

If you've ever had foam on your paper machine wire, you know how costly it can be. Keep that cost down with De-Airex!

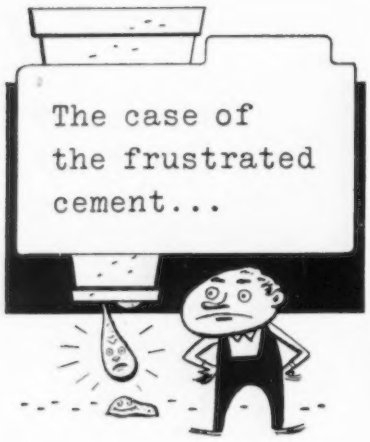
De-Airex is a liquid de-foamer that kills the bubbles before they build up. It's easy to handle, too. De-Airex remains stable—without continual stirring—without fussy premixing—without worrying about pH conditions in your area!

We've arranged tests for many mills that resulted in convincing demonstrations of De-Airex's effectiveness. Try it under your own conditions. Get in touch with the Houghton Man or write directly to E. F. Houghton & Co., 303 W. Lehigh Avenue, Philadelphia 33, Pa.

DE-AIREX FOAM KILLER
. . . a product of

E F HOUGHTON & CO.
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .



In a Chicago cement block plant a short time ago, production was really at a standstill. Try as it would, the frustrated cement just trickled through the hoppers and bins instead of flowing along steadily.

But a CLEVELAND vibrator solved the problem. In short order the trickle of cement increased to a flood.

And, we might add, production really got moving too.

Tell us your materials handling problem, or ask for our detailed literature.

AIR *and* ELECTRIC

2920 Clinton Avenue • Cleveland 13, Ohio

PRICES

MARKET WOOD PULP

Fourth Quarter Contract Prices Per Short Air-Dry Ton

	Delivered Basis		Varying Freight Allowances†		
	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$75.00/$80.00	‡$60.00/$95.00*	$78.00/$85.00§	$80.00/ —	§$77.50/$80.00
Kraft, Bleached	142.50/147.50	145.00/150.00	$142.50/ —		§142.50/ —
Kraft, Blchd. Hdwd.	140.00/ —		$130.00/ —		
Kraft, Semi-bleached	130.00/132.50	130.00/ —	$132.50/135.00§	132.50/137.50*	
Kraft, Unbl.	95.00/105.00	105.00/135.00	*105.00/110.00*	*105.00/135.00*	
Sulphite, Blchd.	140.00/ —	140.00/ —	$137.50/140.00†	140.00/ — *	§135.00/142.50*§
Sulphite, Unblchd.	120.00/ —	120.00/ —	$114.00/125.00†	120.00/125.00*	
Sulphite, Unbl. Gr'sn		124.00/ —	†125.00/ —		
Soda, Blchd.	140.00/ —				

‡ F.o.b. Shipping Point. § On Dock Atlantic Ports. * Freight allowed.

RAG MARKET

New Domestic Cotton Cuttings
Delivered Mill Basis

	Per 100 lbs.
No. 1 White Shirts	$13.50/$14.00
No. 1 Unblchd. Muslins	16.25/ 16.75
Blchd. & Unblchd. Underwears	nominal
No. 1 Light Silesias	7.50/ 8.00
No. 1 Blue Overalls	7.25/ 7.50
Percales	6.00/ 6.50
No. 1 Light Prints	5.50/ 6.00
Suntan Khakis	6.00/ 6.25
Cottonades	3.75/ 4.00
No. 1 Washables	3.00/ 3.25

Old Domestic Cotton Rags
(Prices to Dealers, F.o.b. Ship. Pt.)

	Per 100 lbs.
Mixed White	$2.75/$3.00
Cotton Pants & Overalls	2.00/ 2.25
Thirds and Blues, Repacked	1.65/ 1.75
No. 2 Roofing Rags	nominal

COTTON LINTERS

Memphis Market
F.o.b. Oilmills

	Sept. 28 Per 100 lbs.
Grade 1	n.a.
2	$9.50/ $7.50
3 1st cut—felting	7.00/ 6.00
4	5.50/ 4.25
5	4.00/ 3.00
6 *2nd cut—chemical	3.00/ 3.00
7	3.00/ 3.00

*Based on 73% cellulose.

Bagging
(Prices to Dealers, F.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny	$3.75/$4.50
Foreign Scrap Burlap	3.00/ 3.75
Heavy Wool Tares	4.00/ 4.25
Austr. Wool Pouches	4.00/ 4.50
Domestic Manila Rope	4.50/ 5.00
Domestic No. 1 Sisal Strings	5.00/ 5.25

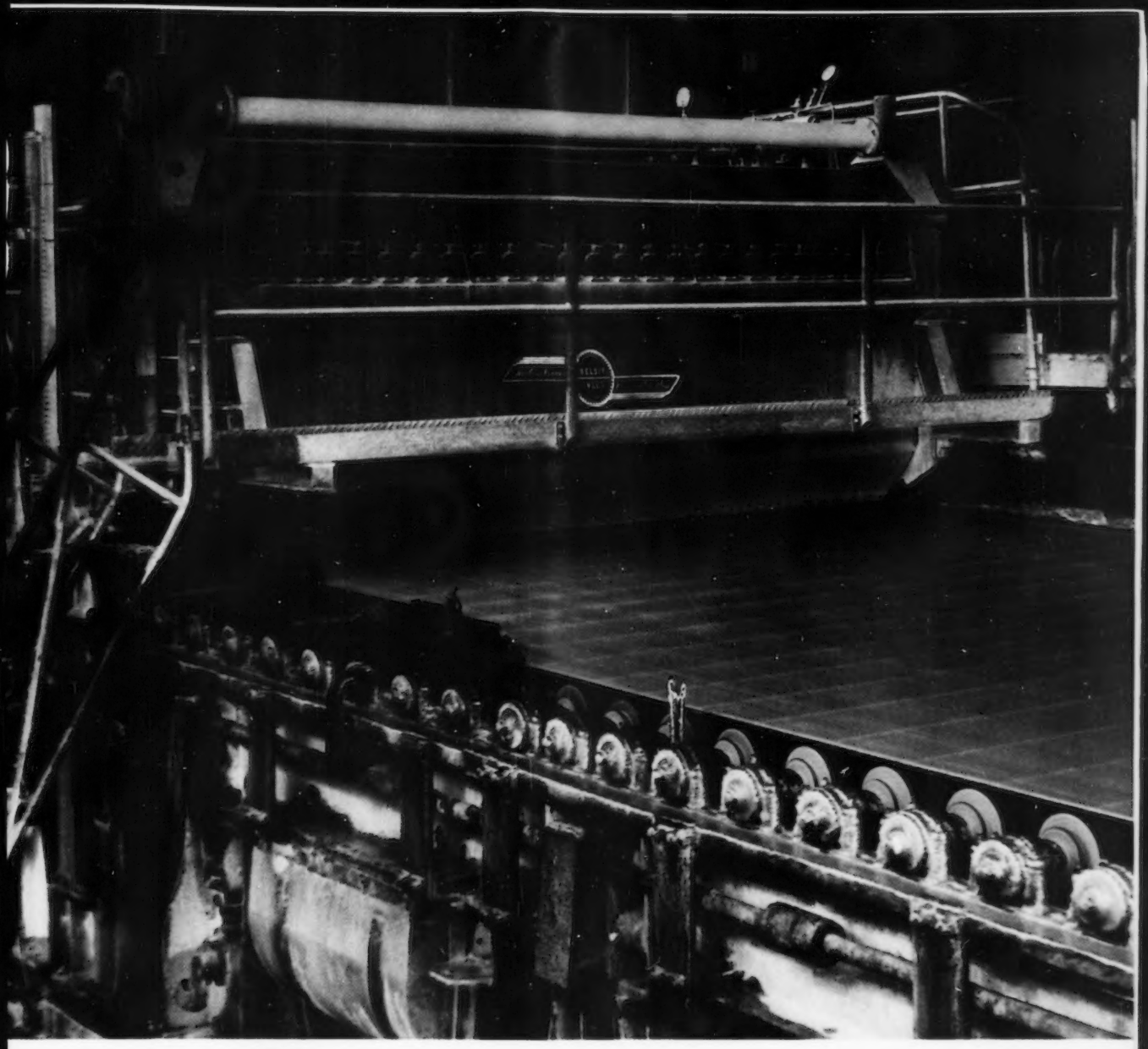
WASTE PAPER MARKET

Mill Prices, F.o.b. Car Shipping Point - Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal. See TRENDS.

	New York	Boston	Chicago	Los Angeles
	Oct. 4	Oct. 2	Oct. 4	Sept. 7
No. 1 Mixed Paper	$ 8.00/ 11.00	$ — / 10.00	$11.00/ —	$14.00/ —
No. 1 News	12.00/ 15.00	12.00/ 14.00	15.00/ —	13.00/ —
Overissue News	18.00/ 23.00	17.00/ 20.00	18.00/ 20.00	13.00/ —
Mill Wrappers	13.00/ 19.00	12.00/ 14.00	14.00/ —	13.00/ —
Old Corrugated Containers	19.00/ 24.00	19.00/ 20.00	22.00/ —	20.00/ —
Super Resorted Kraft Paper	45.00/ 50.00	50.00/ 60.00	40.00/ —	45.00/ —
New Double Kr. Ld. Corr. Cuts	45.00/ 47.50	42.50/ 47.50	42.50/ 47.50	35.00/ 45.00
New 100% Kraft Corr. Cuts	55.00/ 65.00	55.00/ 65.00	60.00/ —	— / —
New Br. Kraft Env. Cuts	75.00/ 85.00	65.00/ 78.00	65.00/ —	45.00/ 50.00
New Br. Kr. Bag Waste Prntd.	55.00/ 60.00	50.00/ 60.00	55.00/ —	45.00/ 50.00
New Br. Kr. Bag Waste Unprntd	70.00/ 80.00	63.00/ 65.00	65.00/ 70.00	— / —
No. 1 Groundwood Shvs.	25.00/ 30.00	25.00/ 30.00	20.00/ 25.00	27.00/ 35.00
White Newsblanks	65.00/ 70.00	60.00/ 65.00	45.00/ —	55.00/ —
No. 1 Soft Wht. Shvs., coated	65.00/ 80.00	70.00/ 80.00	65.00/ —	— / —
Hd. Wht. Shvs.	105.00/110.00	95.00/110.00	100.00/ —	95.00/ —
Hd. Wht. Env. Cuts	125.00/130.00	110.00/130.00	105.00/ —	105.00/ —
Col. Tab. Cards	50.00/ 60.00	— / 60.00	50.00/ —	28.00/ 35.00
Manila Tab. Cards, bales	80.00/ 85.00	80.00/ 90.00	80.00/ —	64.00/ — §
No. 1 Col. Ledger	40.00/ 42.50	40.00/ 50.00	42.50/ —	27.50/ —
White Ledger	57.50/ 65.00	65.00/ 68.00	55.00/ —	45.00/ —
Mixed Book & Mag.†	18.00/ 20.00	18.00/ 22.50	12.50/ —	— / —
No. 1 Rep'd. Hvy. Books ‡	27.00/ 30.00	25.00/ 35.00	25.00/ —	7.00/ 10.00

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% groundwood. § Deld.



FIRST OF FOUR patented Beloit Air-cushioned Inlets which are now in operation at Consolidated Water Power & Paper Company. Stock level inside is automatically held constant at all machine speeds. Self-cleaning rectifier rolls and controlled approach flow help to produce a level, high-quality sheet of uniform caliper.—*Beloit Iron Works, Beloit, Wisconsin.*

BELOIT

PAPER MACHINERY

WHEN YOU BUY BELOIT... YOU BUY MORE THAN A MACHINE!

HAM FELTZ says:

Examine sheet after sheet of Hammermill's fine papers for business and advertising use. Look closely through the entire line of weights and colors—it's dollars to doughnuts you will not find a felt mark.

How come? Well, Hammermill uses felts with such perfect weave, such soft, deep nap, that there isn't a chance that there can be any felt marks. And, because there are no felt marks on Hammermill papers, there is no way to tell what makes of felts they use.

I've got a hunch that HAMMERMILL **uses lots of**

Hamilton Felts

MIAMI WOOLEN MILLS

Established 1858

SHULER & BENNINGHOFEN, HAMILTON, OHIO

More People

R. H. Decker, Jr. Named Eastern Rep. for Gilbert

Gilbert Paper Co., Menasha, Wis., has appointed Randall H. Decker, Jr., as representative covering the eastern territory. Mr. Decker was formerly with Schuylkill Paper Co., Philadelphia, as manager of its Wilmington branch. He also had been associated with A. Hartung, also of Philadelphia, and the Mead Sales Co. Mr. Decker will make his headquarters at the Gilbert eastern office, 501 Fifth Ave., New York.

Welsh Named Supt. of Wis. Cooperative Forestry

Stanley W. Welsh, Madison, has been named superintendent of co-operative forestry by the Wisconsin Conservation Commission. He had been acting superintendent since the retirement of Fred G. Wilson two years ago.

The co-operative forestry division is responsible for advising on the management of farm wood lots and county forests. It also directs the state insect control program for forests and administers the state forest crop law.

Mr. Welsh has been with the State Conservation Department since 1936.

Newton Transferred To Philadelphia

Frank E. Newton, formerly manager of the Ohio Corrugated Box Division of Robert Gair Co., Inc., in Cleveland, has been appointed manager of its Pennsylvania Corrugated Box Division in Philadelphia.

In the industry he served as president of the National Paper Box Assn. from 1951 to 1953 and president of the National Paper Box Suppliers Assn. from 1949 to 1951. He has served as a director of the Folding Box Assn., a member of the Executive Committee and chairman of the Public Relations Committee of that organization.

George N. Carleton Named Scott Director

George N. Carleton has been elected a director and a vice-president of Scott Paper Co. In 1944 Mr. Carleton became a director and president of Detroit Sulphite Pulp & Paper Co., all of the assets of which were acquired by Scott on September 2, and which will be operated as a division of Scott with Mr. Carleton as principal operating executive. Mr. Carleton first joined Detroit Sulphite in 1927 starting with the company's pulpwood operations in Ontario.

Recher to Direct Union's Flexible Packaging Sales

Union Bag & Paper Corp. has appointed Harry M. Recher as director of Flexible Packaging Sales. A member of the Union organization since 1945, Mr. Recher served most recently as director of Honeycomb Sales.

Fowler Succeeds Lewis At Nicolet Paper Corp.

Nicolet Paper Corp., West De Pere, Wis. has named Henry Fowler, formerly assistant general manager and superintendent of the mill to succeed Bert M. Lewis, who passed away September 11, as director and general manager. Herbert Wenberg, formerly technical superintendent will become the assistant general manager.

The policies established by Mr. Lewis will be followed without change.

HEADQUARTERS FOR USED EQUIPMENT

Drives

2—#14 Class E Lewellen vertical ball bearings, 4 to 1 ratio

1—3HX Falk Herringbone 5.28 to 1

1—100 DX Foote Bros. Class 1, 14.2 -1 ratio

2—#4 Class E Reeves open type 4 - 1 ratio, anti-friction bearings

2—D. O. James Herringbone, Size 7 HRA, 12-5 -1 ratio

2—D. O. James 40H

1—Ohio gear reducer, Cat. #D-6-600A, 600 - 1 ratio

1—Sandy Hill hypoid 2.95 to 1 ratio, 8.4 H.P. per 100 RPM (like new)

1—Sandy Hill double reduction 1.34 to 1 ratio, anti-friction bearings

Jordans

2—N & W Pony Monarch —plain bearings

2—N & W Monarchs — plain bearings

4—N & W Mammoth — plain bearings

2—N & W Mammoth — anti-friction bearings

1—Jones Majestic — plain bearings

1—#1 Emerson — plain bearings

Also available a number of spare jordan plugs for different makes of jordans.

THE BLACK-CLAWSON COMPANY

SHARTLE BROS. MACHINE DIVISION

MIDDLETOWN, OHIO

It will speed the reply to your inquiry to mention Paper Trade Journal.

CHAS. T. MAIN, INC.
CONSULTING ENGINEERS
Process Studies, Design, Specifications and Engineering Supervision
PULP AND PAPER MILLS
Steam, Hydraulic and Electrical Engineering
Reports, Consultation and Valuations
80 Federal Street Boston 10, Mass.

THE CARTHAGE MACHINE COMPANY
CARTHAGE, NEW YORK
Manufacturer of
Machinery and equipment for Mechanical and Chemical Pulp Mills and Special Machinery

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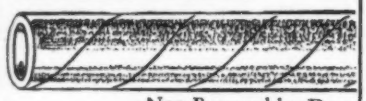
Non-Returnable, Durable standard mill core.

GARTEX

Returnable and Non-Returnable extra strong mill core for regular and special needs.

MADE TO YOUR SPECIFICATIONS
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Sales Offices:
NEW YORK OFFICE, 500 5TH AVE.
PHILA., PA., PHONE MARKET 7-3313
J. E. FRICKE CO.

NEWS OF SUPPLIERS

• BRIDGEPORT THERMOSTAT DIV. of Robertshaw-Fulton Controls Co. broke ground for a new $2 million plant on September 15 on a site located six miles from the heart of downtown Bridgeport, Conn. The modern one-story plant will be nearly double the size of the present plant.

The new plant adds another chapter to the expansion story of Robertshaw-Fulton, which since the first of the year has added new facilities or begun construction at Irwin and Indiana, Pa., Anaheim and Long Beach, Cal., and Toronto, Canada.

• OAKITE PRODUCTS, INC., threw open the doors to their new and expanded laboratories at 350 Hudson street, New York City on September 15. An extensive look into the future of industrial cleaning materials and methods was the feature of the afternoon. John A. Carter, president of the concern, and J. J. Basch, manager of research and product development, were on hand to welcome the visitors.

• BLACK-CLAWSON CO., manufacturers of pulp and paper mill and converting equipment, announces formation of a Canadian subsidiary, Black-Clawson (Canada) Ltd. Cliff R. Crawford, president of The Black-Clawson Co., is president of the subsidiary and Edward M. Root is vice-president and general manager. Offices of Black-Clawson (Canada) Ltd. will be in the Dominion Square Building, St. Catherine Street, Montreal, P.Q.

Black-Clawson (Canada) Ltd. will function as a sales and engineering organization to provide a complete line of Canadian built Black-Clawson paper machinery. For many years past Black-Clawson-Shartle-Dilts equipment has been built and sold throughout Canada by a leading Canadian machinery builder. It is felt, however, that through having its own Canadian organization, better cohesion and integration of the company's activities may be obtained which, of course, will accrue to the interest of the Canadian pulp and paper industry and its expanding economy.

September 30, 1954 has been designated as the date of termination of the existing sales and manufacturing agreement between The Black-Clawson Co., and Alexander Fleck Ltd., Ottawa, Ont.

Alexander Fleck Ltd. and The Black-Clawson Co. have been associated since 1940, following the merger between Dilts Machine Works, Fulton, N. Y., and Black-Clawson Co. Previously Alexander Fleck had been associated with Dilts Machine Works since 1938. During the period of the association, Fleck manufactured and sold Black-Clawson machinery and equipment in Canada in addition to their other lines of equipment for the Pulp and Paper Industry.

AMERICAN PAPER AND PULP ASSOCIATION'S PAPER PRODUCTION RATIO REPORT

(Production as percent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

1954	Aug. 28 90.3	Sept. 4 91.9	Sept. 11 73.4	Sept. 18 92.1r	Sept. 25 96.4
1953	Aug. 29 95.9	Sept. 5 94.8	Sept. 12 76.6	Sept. 19 97.2	Sept. 26 98.2

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1953	94.5	94.6	94.4	92.7	93.9	93.8	82.2	94.7	92.7	97.2	94.6	82.8	92.3
1954	93.3	94.0	93.1	92.2	93.7	89.3	81.1‡	92.6‡					

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1947	1948	1949	1950	1951	1952	1953	1954
Year to Date	103.7	96.9	86.2	95.2	99.6	90.4	92.8	91.3
Year Average	101.7	92.1	83.7	95.8	98.0	88.6	92.3	

PAPERBOARD OPERATING RATIOS†

1954	Aug. 28 92	Sept. 4 91	Sept. 11 70	Sept. 18 93	Sept. 25 92
1953	Aug. 29 98	Sept. 5 98	Sept. 12 76	Sept. 19 100	Sept. 26 98

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1953	91	95	95	95	96	93	81	98	94	97	94	79	93
1954	89	89	90	88	90	89	74	92					

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint Exclusively.

Note: In the above tables *all* the ratios shown are on the basis of a normal 6 and 7 day capacity.

† Per cents of operation based on "Inch-Hours" reported on a 6-day basis to the National Paperboard Association.

PAPER TRADE JOURNAL CLEARING HOUSE PAPER TRADE JOURNAL

RATES FOR ADVERTISING (PAYABLE IN ADVANCE) $.75 cents per line (6 words to line) minimum charge $3.75 —Additional charge of 70 cents if box number is used

Situation wanted advertisements can be repeated for ½ rate

Space in this section can also be purchased at $5.00 per column inch—(1" x 2¼)

Address replies to advertisements appearing under Box Number in care of PAPER TRADE JOURNAL, 15 West 47th Street, New York 36, N. Y.

HELP WANTED

CONFIDENTIAL EMPLOYMENT SERVICE

For paper and pulp mills and paper converting plants. Our service is rendered without charge to employers seeking executives. No charge to applicant until position is accepted. We invite your inquiries.

CHARLES P. RAYMOND SERVICE, INC.
Phone: LIberty 2-6547
294 Washington St., Boston 8, Mass.

O-8

WANTED — Supervisor for bag plant converting operations, preferably one with wide experience in grocery, specialty and sack bag production.

CHARLES P. RAYMOND SERVICE, Inc.
294 Washington St., Boston 8, Mass.
Telephone LIberty 2-6547

O-8

WANTED

Pulp Mill Superintendent for new board mill located in the South. Experience in the production of hardwood pulps made by the neutral sulphite semi-chemical process and a background of bleaching experience essential.

Replies will be kept strictly confidential. Submit age, education, experience, present and past positions. Address Box No. 54-344, care Paper Trade Journal.

O-29

PAPER CHEMIST

For position with nationally-known converter located in Metropolitan area. Background in plastics or adhesives desirable but not necessary. State age, experience and salary desired. Write Box C 577, 300 W. 43 St., N. Y. 36.

O-29

WANTED MACHINE TENDER. Experienced Machine Tender required for fine paper mill making rag content papers. Only men capable of taking full charge of machine and its operation should apply to Box 54-294 care Paper Trade Journal. O-8

WANTED AIR DRIER OPERATOR with experience on Clark Aiken Air Drier. Only men capable of taking full responsibility of machine and its operation need apply to Box 54-293 care Paper Trade Journal. O-8

WANTED BEATER ENGINEER. Mill in Midwest making high grade rag content papers has vacancy for Beater Engineer who is also a good colorman. An excellent opportunity for the capable man. Apply in first instance to Box 54-295 care Paper Trade Journal. O-8

HELP WANTED

TECHNICAL SERVICE DIRECTOR

Excellent opportunity for Technical Service Director in a large progressive pulp and paper mill located in the Middle Atlantic States.

Prefer Ph.D. or M.S. in Chemistry or Chemical Engineering. Candidates must be at least 35 years of age, possess administrative potentialities and have industrial experience in the field of pulp, paper, coatings, quality control and other related problems.

Will be expected to assume full responsibility for the management of the Technical Services Division and conduct programs in Product Improvement and development, process and Equipment studies and train young technical graduates in phases of pulp preparation and paper making.

Remuneration will be commensurate with qualifications. Liberal company benefits. Replies held in strictest confidence. Address Box 54-328 care Paper Trade Journal.

N-5

CHEMIST OR CHEMICAL ENGINEER

Opportunity available for Chemist or Chemical Engineer in an expanding pulp and paper mill located in the Middle Atlantic States. Age 25-35 years with several years experience in pulp and paper chemicals and fibers. Good salary with excellent opportunity for advancement. Send resume of educational background and industrial experience. All replies confidential. Address Box 54-338 care Paper Trade Journal.

N-19

WANTED—Superintendent Sanitary Tissue Converting Plant in Venezuela, S. A. Able to operate, repair, maintain machines and teach others. Wages open, based on experience. You must give all particulars in your reply to De Sola Bros., Inc., 111 Wall Street, New York. O-15

Personnel Service Associates
115 State St., Springfield 3, Mass.
Tel. 6-4749

Personalized Confidential Placement Service for the
Pulp, Paper and related Industries
Administrative—Production
Technical—Sales
Inquiries welcome O-8

Project Engineer

Midwest engineering and construction company seeking graduate mechanical or chemical engineer with several years mechanical engineering experience. Must have recent experience in supervising the design of pulp and paper producing facilities. Position involves coordination of design, assistance in sales pertaining to engineering services and the maintaining of good client relationships.

Position offers long-term employment with attractive salary, paid vacation and holidays, sick leave allowance and company-sponsored group insurance program.

If you feel your background qualifies you for this position please submit complete resume showing experience, education and salary requirements. All replies will be treated confidential. Interviews arranged with qualified applicants. Address Box 54-333 care Paper Trade Journal.

O-15

WANTED SUPERINTENDENT. An excellent opportunity for a keen, energetic man to join the staff of fine paper mill currently making rag content papers for commercial, Government and technical purposes. Successful applicant will act as Assistant Superintendent for a period and when ability proven, promotion will follow. Remuneration commensurate with experience. Applications, which will be treated in strictest confidence, should be addressed to Box 54-292 care Paper Trade Journal. O-8

WANTED—Junior Technician interested in training for supervision of paperboard manufacture. Excellent opportunity for steady advancement in a progressive two machine mill located in the midwest. Age 30-35, with some technical background and experience in paperboard mill operations for paper testing. Your application will be strictly confidential. Address Box 54-346 care Paper Trade Journal. O-8

SITUATIONS WANTED

SUPERINTENDENT

Twenty-six years of practical experience manufacturing high grade folding boxboard, frozen food cartons, other sanitary food packages on six, seven, eight cylinders from sulphite, sulphate, groundwood, old paper stock. Aggressive, capable man. Excellent references. Address Box 54-274 care The Paper Trade Journal.

O-15

Technically trained man with over 25 years' experience in pulp and paper development work seeks challenging opportunity with mill or supplier. New England location preferred. Address Box 54-347, care Paper Trade Journal.

O-22

EXECUTIVE WANTED—We have opportunity for top quality paper mill superintendent for three machine mill, two Cylinders and one Fourdrinier. Excellent plant location. Experience needed for white patent coated bleached manila, all other folding grades, test liner, corrugated medium and light weight chip. Salary $15,000. Telephone, telegraph or write in confidence to—

CHARLES P. RAYMOND SERVICE, Inc.

Phone: LIberty 2-6547 — 294 Washington St. — Boston 8, Mass.

O-8

SITUATIONS WANTED

EXECUTIVE — Works Manager — Paper, Board and Converted Products; seeks challenging opportunity. Highly successful record in all management phases for high volume; profitable production. Employed. Address Box 54-233 care Paper Trade Journal. O-29

COATED PAPER SPECIALIST—BS Chemistry. 20 years experience formulation, color matching paper coatings, gravure and aniline inks, supervision embossing, calendering, printing, finishing operations. Will relocate. Address Box 54-340 care Paper Trade Journal. O-8

DEVELOPMENT — PAPER MAKER AND ENGINEER—Experience covers entire field of cylinder products, specializing in hydration and formation at a lower manufacturing cost with 100% operation. Address Box 54-342 care Paper Trade Journal. O-22

FOR SALE

IMMEDIATE DELIVERY
SUBJECT TO PRIOR SALE
Clark-Aiken Goebels
ROLL SLITTERS & REWINDERS
for
Paper, Film, Foil, Fabric
Suitable for
Telegraph or Cable Paper Rolls, Tape and Shop Counter Rolls, Rolls For Automatic Packaging Machines

High-speed shear-type cutting. Rugged construction and roller bearings for low maintenance. Fast, easy loading and unloading.

1 HSS1-62" Takes rolls up to 62" wide and 35" diameter. Maximum rewind diameter, 31". Approx. speed 2500 f.p.m. Will slit to 1½" wide.

1 HSS1-72" Takes rolls up to 72" wide and 35" diameter. Maximum rewind diameter, 31". Approx. speed 2500 f.p.m. Will slit to 1½" wide.

1 Rapid U Takes rolls up to 36" wide and 39½" diameter. Maximum rewind diameter, 23⅜". Approx. speed 1650 f.p.m. Will slit to ⅜" wide.

Complete accessory equipment available for all machines

For details, write, phone or wire

The Clark-Aiken Co.
154 Springfield Rd. Ph. Lee 700
LEE, MASSACHUSETTS TF

FOR SALE

PRINTING PRESSES
1—42" 4-color Kidder Anilliner. 3—Flexo and 1—Roto Units. V-S. Drive.
1—40" Koenig & Bauer 5-color Gravure Press.
1—40" Waldron Printer Coater
1—36" 2-color Champlain Unit Type Rotogravure.
1—36" 2-Color Mashassett. Roll to Roll with Slitting Attachment.
1—30" 4-color Densatone Flexographic.
1—26" 3-Color Windmoeller & Hoelscher Flexographic. Roll to Roll.
1—24" x 36" Meisel 5-Color Adjustable Rotary Oil Ink Press.
1—26" 3-color Potdevin Flexographic Tail Printer.
1—22" 2 Color Potdevin Roll to Roll Flexographic Press.
2—24" 8 Color Aniline Presses (Stanley Mfg. Co.)
1—Two-color, 3" wide Rotary X Tape Printing Press.

POWER PAPER CUTTERS
12—Seybolds, 1—50" and 1—64" Precision, and 1—65" Model 12 ZF Seybold Precision, equipped with air floats. 1—44" Seybold 60, Auto Spacing and side tables, 54", 64" and 84" 20th Century, 56" and 64" Daytons, 34", 48" and 64" Holyokes.
6—Oswegos, 38", 50", 57", 68", 74" and 84".

CAMACHINES
1—158" Type 19, 60" Mill Roll 40" Rewind.
2—82" Type 10.
1—82" Type 10-A.
1—72" Type 10-14-Mill Type.
1—72" Type 10-11. Shear-cut.
1—62" Type 9-5.
1—62" Type 40-1-AF.
1—42" Type 10-30" rewind.
1—42", 1—52", 62" and 72" Type 10-5.
1—62" Type 10-6.
1—42", 50" & 60" Type 6.
1—50" Type 40-2M
1—42" Type 40-5D (Roll Doctor).
1—42" Type 44W (Roll Doctor).

OTHER SLITTERS
1—132" Appleton Double Drum Winder, 40" rewind.
1—84" Waldron Double Drum Winder
1—72" Langston Type BA Shear-cut. 60" Rewind.
1—40" and 1—60" Langston Type A Shear-cut and 54" and 64" Duplex
1—56" Chambon, Shear-cut.
1—48" Inman Shear-cut, 48" dia. Rewind.
1—40" Kidder Model SL Shear-cut.
1—30" Meisel Shear-cut Series OP.
1—30" and 50" Model B Fales.

MISCELLANEOUS MACHINES
1—50" B.F. Perkins Squeeze Roll Waxing Machine.
5—Die Presses, 1—#34—46" x 34" Sheridan Heavy Duty, 1—Seybold 38" x 24", 2—Smithe 38" x 24", 1—Smithe 40" x 26".
7—Embossers, 1—26", 1—32", 3—60", 1—72" and 1—81".
1—63" Hudson Sharp Toilet Perforator for plain and facial tissue.
1—Paper Converting Machine Co.'s 3 Web Combined ¼ Fold and Dispenser type Napkin Machine.
2—Potdevin Cellophane Bag Machines. Models 372 and 110.
1—Potdevin Model 238 Garment Bag Machine with 2—2-Color Flexographic Tailprinters.
3—Potdevin Bag Machines, #101, 102 and 103, complete with two 2-Color Flexographic Tailprinters and AC Motor Equipment.
3—Roto Cellophane Bag Machines.
1—120" and 140" Hamblet Duplex Sheeters with backstands and layboys
1—48", 72" and 100" Hamblet Single Rotary Sheeters with Backstands and Layboys, 1—30" & 1—72" plain Hamblet Sheeters.
2—Schultz Automatic Rewinders. 1—18" & 1—24" for Foil or Paper.
1—#18 Lake Erie Acraplate rubber plate machine.
1—Staude Century Straight Line Folder & Gluer.
1—60" Chambers Varnishing Machine.

PAPER AND PULP MILL MACHINERY
1—75" Norwood 10 Roll Calender Stack. Vickery Doctors. Sturtevant Blower System. 75 HP Motor with Ajusto Spede Drive.
1—66" Beloit 10 Roll Calender Stack, Vickery Doctors. Sturtevant Blower System. 50 HP Motor with Ajusto-Spede Drive.
1—12' dia. x 140" face, high pressure type Yankee Dryer.
1—10# Dilts Laboratory Beater complete with AC Motor Equipment.
1—#3A Bird Screen.
1—9' x 25' D. J. Murray Barking Drum.

GIBBS-BROWER CO., INC.
Please address reply to Room 902
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Showing the ownership, management and circulation of PAPER TRADE JOURNAL, published weekly at East Stroudsburg, Pa., for October 1, 1954.

1. The names and addresses of the publisher, editor, managing editor, and business manager are: Publisher, George E. Lockwood, 15 West 47th st., New York 36, N. Y.; Editor, John C. W. Evans, 15 West 47th st., New York 36, N. Y.; Managing Editor, R. E. Thuemmes, 15 West 47th st., New York 36, N. Y.; Business Manager, Arthur E. Gordon, 15 West 47th st., New York 36, N. Y.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Lockwood Trade Journal Co., Inc., 15 West 47th st., New York 36, N. Y. Stockholders: George E. Lockwood, 15 West 47th st., New York 36, N. Y.; Solomon Mayer, 15 West 47th st., New York 36, N. Y.; John J. Banninga, 15 West 47th st., New York 36, N. Y.; Marion C. Bogert, 15 West 47th st., New York 36, N. Y.; Edythe Z. Ellison, 15 West 47th st., New York 36, N. Y.; T. R. Lasser, 15 West 47th st., New York 36, N. Y.; A. J. Pearson, 15 West 47th st., New York 36, N Y.; George E. Lockwood and Frederick E. Winkler, Trustees U.T.A.F.B.O.; George E. Lockwood, Jr., 15 West 47th st., New York 36, N. Y., dated June 15, 1953; George E. Lockwood and Frederick E. Winkler, Trustees U.T.A.F.B.O.: Katherine R. Lockwood, 15 West 47th st., New York 36, N. Y., dated June 15, 1953; George E. Lockwood and Frederick E. Winkler, Trustees U.T.A.F.B.O.: Barbara Louise Lockwood, 15 West 47th st., New York 36, N. Y., dated June 15, 1953; George E. Lockwood and Frederick E. Winkler, Trustees U.T.A.F.B.O., for the benefit of: Robert M. Lockwood, 15 West 47th st., New York 36, N. Y., dated June 15, 1953; George E. Lockwood and Frederick E. Winkler, Trustees U.T.A.F.B.O.: Frederick A. Lockwood, 15 W. 47th St., New York 36, N. Y., dated June 15, 1953; George Saxe Macdonald Trust, Bankers Trust Co., 16 Wall st., New York 5, N. Y.; George E. Lockwood, 15 West 47th st., New York 36, N. Y., Trustees.

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5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above was 5724. (This information is required from daily, weekly, semiweekly and triweekly newspapers only.)

ARTHUR E. GORDON,
(Signature of Business Manager)

Sworn to and subscribed before me this 1st day of October, 1954.

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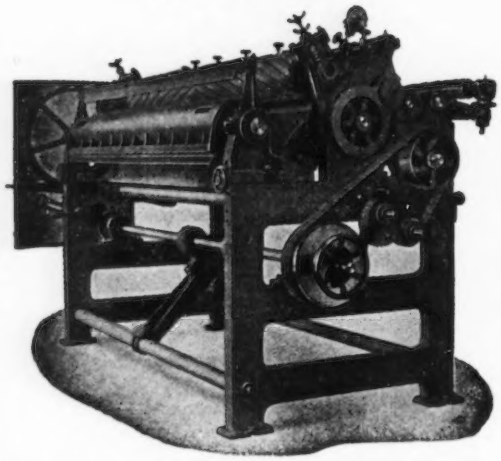

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D. J. Murray Mfg. Co.
Newport News Shipbldg. & Dry Dock Co.
Sandy Hill Iron & Brass Works
Valley Iron Works Co.

BARS
John W. Bolton & Sons, Inc.
Dilts Machine Works
E. D. Jones & Sons Co.
Ross-Midwest Fulton Corp.
The Moore & White Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

BASIC WEIGHT SCALES
Testing Machines, Inc.

BEARINGS
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dodge Mfg. Corp.
Downington Mfg. Co.
B. F. Goodrich Co.
E. D. Jones & Sons Co.
Link Belt Co.
Magnus Metal Corp.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Timken Roller Bearing Co.
The Torrington Co.
Valley Iron Works Co.
Westinghouse Electric Corp.

BEATERS AND JORDANS
Apmew, Inc.
The Appleton Machine Co.
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Hermann Mfg. Co.
E. D. Jones & Sons Co.
Ross-Midwest Fulton Corp.
Morden Machines Co.
Renningen-Petter Co.
J. J. Ross Company
Ross Paper Machy Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

BEATER FILLINGS
John W. Bolton & Sons, Inc.
Ronningen-Petter Co.

BED PLATES
Bahr Brothers Mfg. Co.
John W. Bolton & Sons, Inc.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Lukenweld Div., Lukens Steel Co.
Moore & White Co.
Ross-Midwest Fulton Corp.
Ronningen-Petter Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

BELTING
Goodrich, B. F., Co.
The Goodyear Tire & Rubber Company
Link Belt Co.
U. S. Rubber Co.

BLEACHING AGENTS
Antara Chemicals Division, General Dyestuffs Corp.
Buffalo Electro-Chemical Co.
Columbia-Southern Chem. Corp., Sub. of Pittsburgh Plate Glass Co.
E. I. du Pont de Nemours & Co., Inc.
Rohm & Haas Company

BLEACHING APPARATUS
Jackson & Church Co.
E. D. Jones & Sons Co.
Moore & White Co.
Perkins & Sons, Inc., B. F.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

BLOW PIPES & PITS
Carthage Machine Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company

BLOWERS
Allis Chalmers Mfg. Co.
Buffalo Pumps, Inc.
Read Standard Corp.
Roots-Connersville

BOARD MACHINES
Beloit Iron Works
Black Clawson Company
Downingtown Mfg. Co.
Moore & White Co.
Ross Paper Machinery Co.
Ronningen-Petter Co.
Sandy Hill Iron & Brass Works.

BOILERS
Babcock & Wilcox Co.
James Leffel Co.

BOXBOARD SCALES
Testing Machines, Inc.

BRAKES
Horton Mfg. Co., Inc.

BRUSH ROLLS
M. W. Jenkins Sons, Inc.
Gus Reidel & Son

BRUSHES
M. W. Jenkins Sons, Inc.
Gus Reidel & Son
Smith & Winchester Mfg. Co.

BURSTING TESTERS
Cady & Co., E. J.
B. F. Perkins & Son Inc.
Testing Machines, Inc.

CALENDERS
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdell United Co.
Moore & White Co.
Perkins & Sons, Inc., B. F.
J. J. Ross Company
Ross Paper Machy Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

CARRIER ROPE
Williams-Gray Co.

CASEIN
Borden Company
Dunkel, Paul A., & Co.

CASTINGS
Aluminum Co. of America
Appleton Machine Co.
The Bagley & Sewall Company
Black Clawson Company
Babcock & Wilcox Co.
Carthage Machine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Hamblet Machine Co.
Lobdell United Co.
Magnus Metal Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.
Nichols Engrg. & Research Corp.
Ross, J. O., Engrg. Co.
Shartle Brothers Machine Co.

CENTRIFUGES
Williams Apparatus Co.

CHAINS
Jeffrey Mfg. Co.
Link Belt Co.

CHEMICAL COTTON PULP
Hercules Powder Co.

CHEMICAL SPRAYS
Vapo Systems Co.

CHEMICALS
American Cyanamid Co., Industrial Chem. Div.
Antara Chemicals Division, General Dyestuffs Corp.
Arnold, Hoffman & Co., Inc.
Calgon, Inc.
Columbia-Southern Chem. Corp., Sub. of Pittsburgh Plate Glass Co.
Diamond Alkali Co.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., Inc.
B. F. Goodrich Chemical Co.
Gottesman & Co.
Hercules Powder Co.
Heyden Chemical Corp.
Hooker Electrochemical Co.
Koppers Company, Inc.
Monsanto Chemical Company
National Aluminate Corp.
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Pennsylvania Indust. Chem. Corp.
Rohm & Haas Company
Wyandotte Chemicals Corp., Michigan Alkali Div.

CHESTS
The Bagley & Sewall Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Ross-Midwest Fulton Corp.
Shartle Bros. Mch. Co.

CLARIFIERS
Graver Tank & Mfg. Co.
Permutit Company

CLAYS
United Clay Mines

CLEANING MATERIALS
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuffs Corp.
Arnold, Hoffman & Co., Inc.
Columbia-Southern Chem. Corp., Sub. of Pittsburgh Plate Glass Co.
Diamond Alkali Co.
The Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
Monsanto Chemical Company
Nopco Chemical Co.
Wyandotte Chemicals Corp., J. B. Ford Division

CLUTCHES
Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dodge Mfg. Corp.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Horton Mfg. Co., Inc.
Hudson-Sharp Mch. Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.

COARSE SCREENS
Bird Machine Company

COATING & BRIGHTENING AGENTS
Burgess Pigment Co.

COATING MACHINERY
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Hudson Sharp Machine Co.
The Mayer Machine Co., Inc.
Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G., & Co., Inc.

COATING MATERIALS
American Cyanamid Company, Industrial Chemicals Division
Burgess Pigment Co.
The Dow Chemical Co.
E. I. du Pont de Nemours & Co., Inc.
B. F. Goodrich Chemical Co.
The Goodyear Tire & Rubber Company
Hercules Powder Co.
J. M. Huber Corp.
Koppers Company, Inc.
Monsanto Chemical Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Thiele Kaolin Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

COATINGS, CORROSION PROOF
Insul-Mastic Corp. of America

COATING ROLLS
Stone, Thos. & Geo. M., Inc.

COMPRESSORS
Allis Chalmers Mfg. Co.
Nash Engineering Co.
Read Standard Corp.
Roots-Connersville Blower Corp.

CONDENSATE FILTERS
Hungerford & Terry, Inc.
Permutit Company

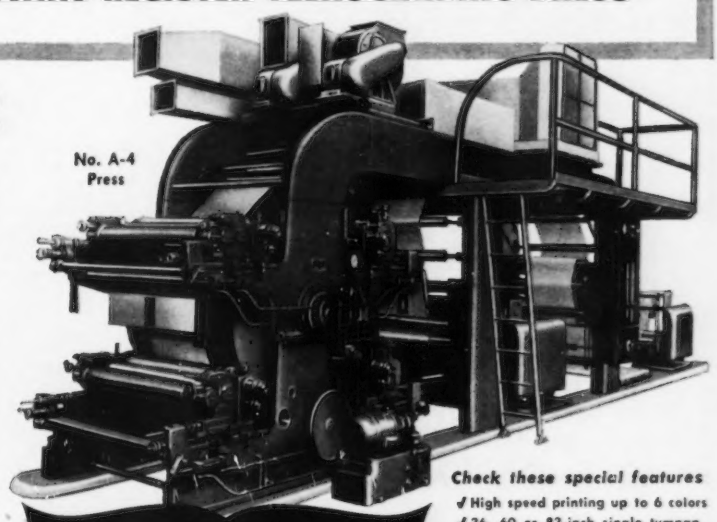
CONDENSATION CONTROL
Insul-Mastic Corp. of America

The world's fastest

CONSTANT REGISTER FLEXOGRAPHIC PRESS

Prints one to four colors in accurate register on all types of flexible, S-T-R-E-T-C-H-Y materials

Thin papers, cellophane, foils and all the new film type materials are printed in accurate color register on this increasingly popular press. Large drum type impression cylinder accurately controls web through all color stations. Automatic electric drives maintain constant web tension at all times and rewinder features flying splice for continuous production without roll change stoppage. Other features include splashproof fountains, hydraulic throw-outs, continuous operating ink units, drying ovens and sheet threading device. Standard press up to six colors in any width from 20" to 50"—print repeats 12" to 36". Larger presses on special order.



No. A-4 Press

Single Impression Cylinder

. . . Around which color stations are mounted, accurately controls material stretch or expansion permitting 24 hr. continuous register of all colors.

Write for new general line catalog on presses and allied processing machines.

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Manufacturers of
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- ✓ Constant, one setting color register
- ✓ Automatic tension web controls
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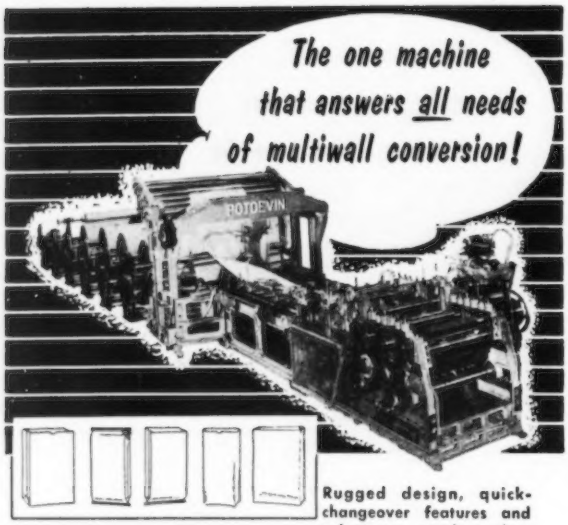
- ✓ Continuous operating splash-proof ink fountains
- ✓ Automatic color throw-outs
- ✓ Prints 20" to 50", repeats up to 36"
- ✓ Continuous smooth drive operation
- ✓ Over-head lead for easy accessibility, better drying and handling
- ✓ Flying splice rewinder



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2 to 6 ply Multiwall Tuber

Rugged design, quick-changeover features and advance engineering reduce down-time to a minimum. Maximum production every working hour . . . a marketable tube with every click of the cut-off. Produces 2 to 6 ply tubes 10" to 26" wide by 20" to 54" long at rate of 100,000 a day.

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U. S. DEFENSE BONDS

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APPRAISALS • WATER PLANS • STEAM UTILIZATION •
STEAM POWER PLANTS • HYDRO-ELECTRIC •, REPORTS

CONDENSERS
Allis Chalmers Mfg. Co.
Permutit Company
Ross-Midwest Fulton Corp.
Westinghouse Elec. Corp.

CONDITIONERS
Vapo Systems Co.

CONDUITS
Aluminum Co. of America

CONSISTENCY REGULATORS
Bird Machine Company
DeZurik Shower Company
Pandia, Inc.

CONSULTING ENGINEERS
Cummins & Barnard, Inc.
Ebasco Services
Frank W. Egan & Co.
Ferguson, H. K., Company
Kalamazoo Sheet Metal Mfg. Co.
R. C. Mahan Co.
Main, Inc., Chas. T.
Rust Engrg. Co.
J. E. Sirrine & Co.
Vapo Systems Co.
John Waldron Corp.

CONTINUOUS DIGESTER
Pandia, Inc.

CONTROLLERS
Black Clawson Company

CONTROLS
Allis Chalmers Mfg. Co.
Airmatic Valve, Inc.
Johnson Corp.
Poirier Control Co.
Ronningen-Petter Co.
Shartle Brothers Machine Co.
Westinghouse Electric Corp.

CONVERTING MACHINERY
The Bagley & Sewall Company
Dilts Machine Works
Egan, Frank W., & Co.
Hudson Sharp Machine Co.
Paper Converting Machine Co.
Potdevin Machine Co.
Ross Paper Machinery Co.
Waldron, John, Corp.

CONVEYORS
Black Clawson Company
Downingtown Mfg. Co.
Enterprise Company
Jeffrey Mfg. Co.
Link Belt Co.
Murray, D. J., Mfg. Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.

CORES
Eastman Paper Co.
Mead Board Sales, Inc.
Mercer Paper Tube Co.
Sonoco Products Co.

CORROSION RESISTANT COATINGS
Insul-Mastic Corp. of America

COTTON LINTER
Hercules Powder Co., Inc.
Railway Supply & Mfg. Co.

COUCH ROLLS
Beloit Iron Works
Black Clawson Company
Downingtown Mfg. Co.
Manchester Machine Co.
Stowe-Woodward Inc.
Tyer Rubber Co.

COUPLINGS
Ajax Flexible Coupling Co.
The Bagley & Sewall Company
Black Clawson Company
Downingtown Mfg. Co.
Emerson Mfg. Co.
Farrel-Birmingham Co., Inc.
Herman Mfg. Co.
E. D. Jones & Sons Co.
Dodge Mfg. Corp.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John

CRANES
Whiting Corp.

CURL TESTERS
Testing Machines, Inc.

CUTTERS
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson Sharp Machine Co.
Moore & White Co.
Perkins & Son, Inc., B. F.
Ross Paper Machinery Co.
The Sandy Hill Iron & Brass Works
The Smith & Winchester Mfg. Co.
Taylor, Stiles & Co.

CYLINDER MOULDS
Black Clawson Company
Downingtown Mfg. Co.
Manchester Machine Co.
Ross Paper Machinery Co.

CYLINDERS
M. W. Jenkins Sons, Inc.

CYLINDER WIRES
Lindsay Wire Weaving Co.

DAMPENERS
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

DECKLE SHOWERS
Ronningen-Petter Co.

DECKLE STRAPS
Stowe-Woodward Inc.

DECKLE WEBBING
Williams-Gray Co.

DEFOAMERS
Arnold Hoffman & Co., Inc.
Hercules Powder Co.
Houghton & Co.

DEINKING
Bird Machine Co.
Dilts Machine Works
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DEINKING CHEMICALS
Antara Chemicals Division, General Dyestuff Corp.
E. I. du Pont de Nemours & Co., Inc.
Nopco Chemical Co.

DE-MINERALIZING EQUIPMENT
Hungerford & Terry, Inc.
Permutit Company

DENSOMETERS
Testing Machines, Inc.
W. & L. E. Gurley

DESIGN CONSTRUCTION
Ebasco Services

DETERGENTS
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuffs Corp.
Arnold, Hoffman & Co., Inc.
Calgon, Inc.
Diamond Alkali Co.
Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Company
Wyandotte Chemicals Corp., Michigan Alkali Div.

DEWAXING CHEMICALS
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuffs Corp.
Arnold, Hoffman & Co., Inc.
Nopco Chemical Co.

DIGESTER CIRCULATING SYSTEMS
Sandy Hill Iron & Brass Works

DIGESTERS
Babcock & Wilcox Co.
Bauer Bros. Co.
Blaw Knox Company
Chicago Bridge & Iron Co.
Graver Tank Mfg. Co.
Pandia, Inc.
Pusey & Jones Corp.
A. O. Smith Corp.

DISPERSING AGENTS
Antara Chemicals Division, General Dyestuffs Corp.
Arnold, Hoffman & Co., Inc.
Calgon, Inc.
Diamond Alkali Co.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Company
Wyandotte Chemicals Corp., Michigan Alkali Div.

DOCTORS
The Bagley & Sewall Company
Bird Machine Company
Black Clawson Company
Downingtown Mfg. Co.
Lobdell United Co.
Lodding Engineering Corp.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
The Bagley & Sewall Company
Bird Machine Company
Black Clawson Company
John W. Bolton & Sons, Inc.
Lodding Engineering Corp.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Simonds Saw & Steel Co.
Westinghouse Electric Corp.

DOCTOR OSCILLATORS
Ronningen-Petter Co.

DRIERS
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Lukenweld
Mahon, R. C., Co.
Moore & White Co.
Murray Mfg. Co., D. J.
J. J. Ross Company
Red-Ray Mfg. Co., Inc.
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

DRIERS—LABORATORY
Testing Machines, Inc.

DRILLED SUCTION COUCH ROLLS
Downingtown Mfg. Co.
Manchester Machine Co.
Ross Paper Machinery Co.

DRILLED SUCTION DRUM ROLLS
Downingtown Mfg. Co.
Manchester Machine Co.
Ross Paper Machinery Co.

DRIVES
Allis Chalmers Mfg. Co.
Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Bird Machine Co.
Black Clawson Company
Dodge Mfg. Corp.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Company
Gibbs-Brower Company, Inc.
Horton Mfg. Co.
Jeffrey Mfg. Co.
Link Belt Co.
Manchester Machine Co.
Moore & White Co.
Murray, D. J., Mfg. Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

DRUM WINDERS
Black Clawson Company
Downingtown Mfg. Co.
Manchester Machine Co.
Ross Paper Machinery Co.

DRYER ROLL PYROMETER
Ross-Midwest Fulton Corp.
Testing Machines, Inc.

DUSTERS
Appleton Machine Co.
Frank W. Egan & Co.
M. W. Jenkins Sons, Inc.
E. D. Jones & Son Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Waldron, John, Corp.

DUSTING BRUSHES
M. W. Jenkins Sons, Inc.

DYESTUFFS
Ciba Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., The
General Dyestuffs Corp.

ELECTRIC HYDROMETER
Testing Machines, Inc.

ELECTRICAL PRECIPITATORS
Research Corporation

EMBOSSING MACHINES
Dilts Machine Works
Egan, Frank W., & Co.
Hudson Sharp Machine Co.
Paper Converting Machine Co.
Potdevin Machine Co.
John Waldron Corp.

EMBOSSING ROLLS
The Appleton Machine Co.
Gibbs-Brower Company, Inc.
Holyoke Machine Co.
Hudson Sharp Machine Co.
B. F. Perkins & Son, Inc.
Stone, Thos. & Geo. M., Inc.
John Waldron Corp.

EMPLOYMENT SERVICE
Bixby, R. W., Inc.
Raymond, Chas. P., Service, Inc.

EMULSIFIERS
Antara Chemicals Division, General Dyestuffs Corp.
Arnold, Hoffman & Co., Inc.
Nopco Chemical Co.
Rohm & Haas Company
Wyandotte Chemicals Corp.

ENZYMES
Rohm & Haas Company
Vanderbilt Co., R. T.

EVAPORATORS
Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.
Westinghouse Electric Corp.

EXPANDERS
Mount Hope Machinery Co.

FABRICATORS
R. C. Mahon Co.
Ronningen-Petter Co.

FANS
Buffalo Pumps, Inc.
General Electric Co.
B. F. Perkins & Son, Inc., Roots-Connersville Div.
Ross Engineering Co., J. O.
Westinghouse Electric Corp.

FEEDERS
Jeffrey Mfg. Co.
Merrick Scale Mfg. Co.
Permutit Company

FELTS
Albany Felt Co.
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Draper Bros. Corp.
Huyck & Son, F. C.
Knox Woolen Company
Lockport Felt Co.
Shuler & Benninghofen
Waterbury Felt Co.
Williams-Gray Co.

FELT CLEANERS
Antara Chemicals Division, General Dyestuffs Corp.
Calgon, Inc.
Nopco Chemical Co.

FELT CONDITIONERS
Bird Machine Co.
Downingtown Mfg. Co.
Mount Hope Machinery Co.
The Sandy Hill Iron & Brass Works

FELT EXPANDERS
Mount Hope Machinery Co.

FELT GUIDES
Beloit Iron Works
Black Clawson Company
Downingtown Mfg. Co.
Frank W. Egan & Co.
Gilbert & Nash Co.
Moore & White Co.
Mount Hope Machinery Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FELT PRESERVERS
Mount Hope Machinery Co.

FELT SHOWERS
Ronningen-Petter Co.

FIBRE BOARD MACHINES
Black Clawson Company
Sandy Hill Iron & Brass Works

FIBRE GLASS
Pittsburgh Plate Glass Co.

FILLERS
American Cyanamid Company, Industrial Chemicals Division
J. M. Huber Corp.
Thiele Kaolin Co.
Vanderbilt Co., R. T.
Wyandotte Chemicals Corp., Michigan Alkali Div.

FILLINGS
Bahr Bros. Mfg. Co.
John W. Bolton & Sons, Inc.
Ronningen-Petter Co.
Shartle Brothers Machine Co.

FILTER MEDIA
Hungerford & Terry, Inc.
Palmer Filter Equipt. Co.

FILTERS
Bird Machine Company
Holyoke Machine Co.
Hungerford & Terry, Inc.
Johnson Corp.
Moore & White Co.
Permutit Company
Ronningen-Petter Co.
J. O. Ross Engrg. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Walworth Company

Let us tell you how leading fine writing paper and roofing paper mills are using this modern cutting equipment to their great advantage.

Are Your Rag Cutters DOING Their Full Job?

TAYLOR-STILES RAG CUTTERS

—do a superior job in taking over much of the work of the beaters. Beaters that do not have to tear large pieces of woven fabrics apart do a better and faster job—in number of beaters required to meet production requirements—with a tremendous saving in total power consumption—a sharp saving in beater time.

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FILTERS, LIME MUD
Bird Machine Company

FILTER SCREENS
Ronningen-Petter Co.

FINE SCREENS
Bird Machine Company
Sandy Hill Iron & Brass Works

FITTINGS
The Bagley & Sewall Company
Crane Company
Grinnell Company
Pittsburgh Piping & Equipt. Co.
Shartle Brothers Machine Co.
Walworth Company

FLEXIBLE COUPLINGS
Dodge Manufacturing Corp.
Egan, Frank W., & Co.
Jeffrey Mfg. Co.
Shartle Brothers Machine Co.
John Waldron Corp.
Westinghouse Electric Corp.

FLOORING, GRATING AND TREADS
The Goodyear Tire & Rubber Company
Norton Co.

FLOTATION EQUIPMENT
Ronningen-Petter Co.
Walker Process Equipment, Inc.

FLOW BOXES
Lukens Steel Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

FLUID FILTERS
Ronningen-Petter Co.

FOLDERS
Emerson Mfg. Co.
Hudson Sharp Machine Co.

FORMATION TESTERS
Testing Machines, Inc.
Williams Apparatus Co.

FOURDRINIERS
Beloit Iron Works
Black Clawson Company
Downingtown Mfg. Co.
Manchester Machine Co.
Moore & White Co.
Ross Paper Machinery Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

FREENESS TESTERS
Testing Machines, Inc.
Williams Apparatus Co.

GASKETS
B. F. Goodrich Co.
The Goodyear Tire & Rubber Company

GEAR MOTORS
Allis Chalmers Mfg. Co.
Elliott Company, Inc.
Westinghouse Electric Corp.

GEAR REDUCERS
Dodge Mfg. Corp.
Downingtown Mfg. Co.

GEAR REDUCER DRIVES
Link Belt Co.

GEARS
The Bagley & Sewall Company
Black Clawson Company
Downingtown Mfg. Co.
Frank W. Egan & Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Westinghouse Electric Corp.

GRAPHIC MACHINERY
Dilts Machine Works
Hudson Sharp Mch. Co.
Lyddon & Co.
Parsons & Whittemore
Potdevin Machine Co.

GRAPPLES
Blaw-Knox Company
Owen Bucket Co.
Wellman Engrg. Co.

GRATINGS
Blaw-Knox Co.

GRINDERS
Carthage Machine Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Lobdell United Co.
Norton Company
Ross Paper Machinery Co.
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
Norton Company
Simonds Abrasive Co.

GUIDES
The Bagley & Sewall Company
Beloit Iron Works
Black-Clawson Co.
Downingtown Mfg. Co.
Egan, Frank W., & Co.
Gilbert & Nash Co.
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Waldron, John, Corp.

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Potdevin Machine Co.
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Wyandotte Chemicals Corp., Michigan Alkali Div.

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Sandy Hill Iron & Brass Works
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JORDANS
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Valley Iron Works Co.

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Moore & White Co.
Shartle Brothers Machine Co.
Simonds Saw & Steel Co.
Taylor Stiles & Co.
Valley Iron Works Co.

KNOTTERS
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Sandy Hill Iron & Brass Works

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Bird Machine Company
Cady & Co., E. J.
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W. & L. E. Gurley
Egan, Frank W., & Co.
E. D. Jones & Sons Co.
Ronningen-Petter Co.
Shartle Brothers Machine Co.
Taylor Instrument Companies
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Williams Apparatus Co.

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Black-Clawson Company
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Lukenweld
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The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

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National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Company

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Aktivin Division, Heyden Chemical Corp.
Arnold, Hoffman & Co., Inc.
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Nopco Chemical Co.
Rohm & Haas Company

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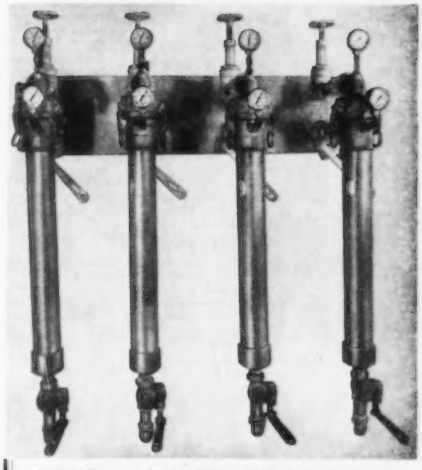

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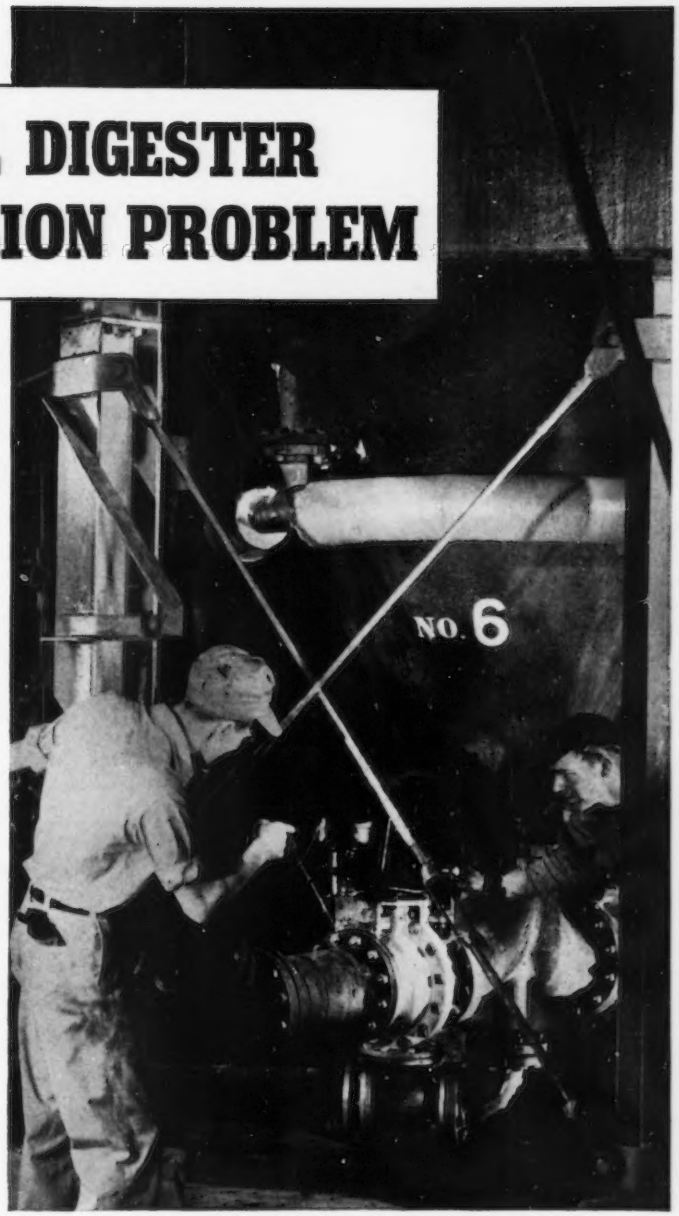
CLAD STEEL DIGESTER BEATS CORROSION PROBLEM

This big Northwest papermaker had an expensive equipment replacement headache. Corrosion was cutting digester life short. Then it was decided to specify stainless clad steel in the fabrication of these vertical sulphate digesters. There was no other design change. Now, increased equipment life alone has saved thousands of dollars in replacement costs.

Clad steel in these digesters furnishes the corrosion resistance of expensive solid high-alloy plate at much lower original costs. Highly corrosive "cook" working at 300° F. can't get behind the permanent and integral bond of cladding to backing steel. The sudden pressure change of "blows" and the shock of cold charges hitting hot digester walls don't faze it. And the clad steel surface is free from indentations and ripples which accelerate scale build-up.

In digesters, evaporators, filters, head boxes, acid storage tanks and other key equipment, you can meet the needs of your process problems. Be sure you have a combination of good engineering, the economical versatility of clad steels, and the knowledge and resources of a *qualified* fabricator. Whether you are looking for reduced costs in original equipment . . . high product quality . . . increased throughput . . . or economy in maintenance, it pays to consult your equipment builder *early* in your planning. Working with your engineers and consultants, he can help you obtain the equipment dependability and efficiency your process demands.



Economical clad steel sulphate digesters save thousands in replacement costs alone.

Ask one of your fabricators to show you the new Lukens clad steel movie, "Equip for New Profits." Here—in full color and sound—are factual accounts of how clad steel equipment brings new economies. The story can suggest new ideas to everyone concerned with production efficiency. Or contact Manager, Marketing Service, Lukens Steel Company, 683 Lukens Building, Coatesville, Pa.

LUKENS CLAD STEELS

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PRODUCER OF THE WIDEST RANGE OF TYPES AND SIZES OF CLAD STEELS AVAILABLE ANYWHERE

New Dodge-Timken pillow block is lighter, more compact—but withstands heavy shock loads

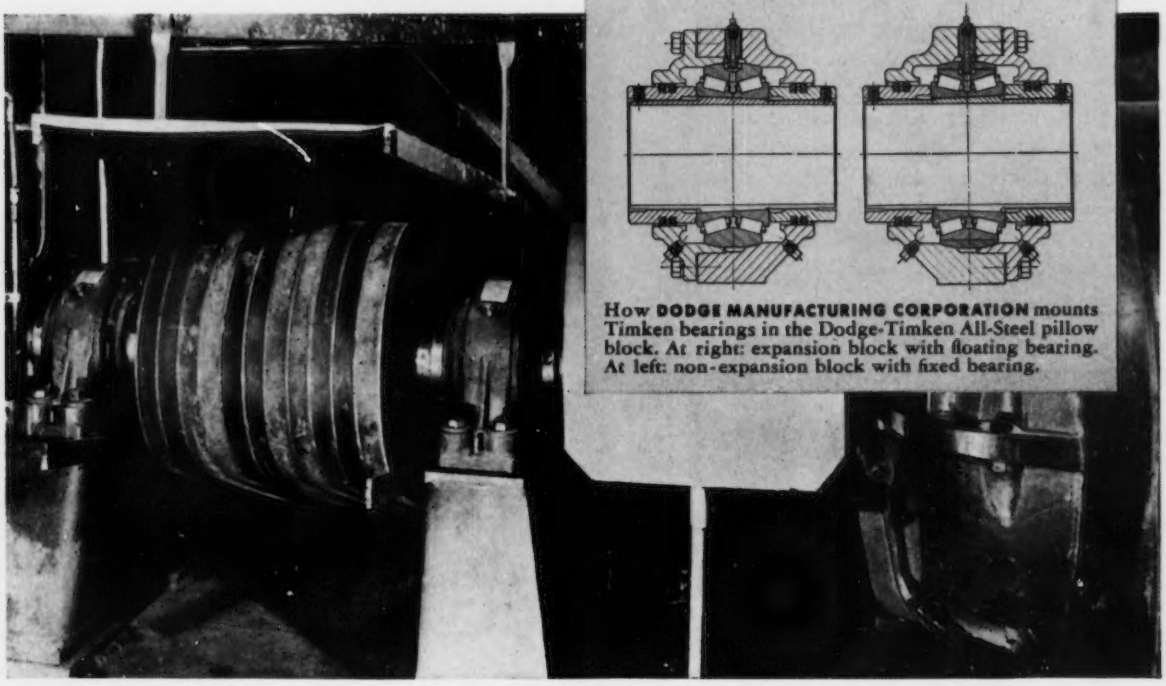
A LITTLE over a year ago the Dodge Manufacturing Corporation in Mishawaka, Indiana, and The Timken Roller Bearing Company developed a brand new All-Steel pillow block. The picture shows one of many installations—an expansion block at left and a non-expansion block at right in a drive for a Timken® bearing equipped Hydrapulper manufactured by The Black-Clawson Company's Shartle Bros. Machine Division.

This new pillow block utilizes a special new type of self-aligning tapered-bore Timken bearing. It's the ideal block to use where space is limited because it packs high load capacity in a small space. Here's why: 1. Construction is all-steel, strong. 2. There are no special thrust devices to take up space—Timken bearings take both radial AND thrust loads. 3. Timken bearings have high load capacity because of the *full line contact* between rollers and races.

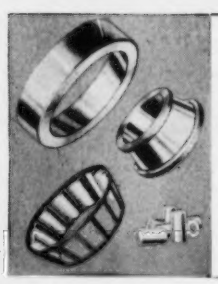
All-steel construction and Timken bearings also give this new block excellent resistance to shock loads. All races and rollers in Timken bearings are case-carburized and have a tough, impact-resistant core under a superhard surface. And to get *all* these advantages, Shartle Bros. mounts the horizontal and vertical drive shafts and main drive of its Hydrapulper on Timken tapered roller bearings.

Be sure you get all the advantages of Timken bearings when you buy or build pillow blocks or any other piece of equipment. To make the best bearings, we start by making our own fine alloy steel—the only bearing manufacturer in the U. S. A. that does. Look for the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **DODGE MANUFACTURING CORPORATION** mounts Timken bearings in the Dodge-Timken All-Steel pillow block. At right: expansion block with floating bearing. At left: non-expansion block with fixed bearing.



DESIGN LEADERSHIP

The first Timken tapered roller bearing was produced in 1898. Since then the one-piece multiple perforated cage, wide area contact between roller ends and ribs, and every other important tapered roller bearing improvement have been introduced by The Timken Roller Bearing Company.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis steels.

TIMKEN

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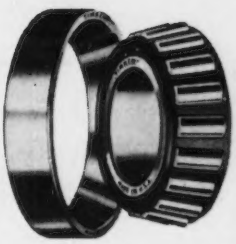
TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ↓ AND THRUST →○← LOADS OR ANY COMBINATION →✳←